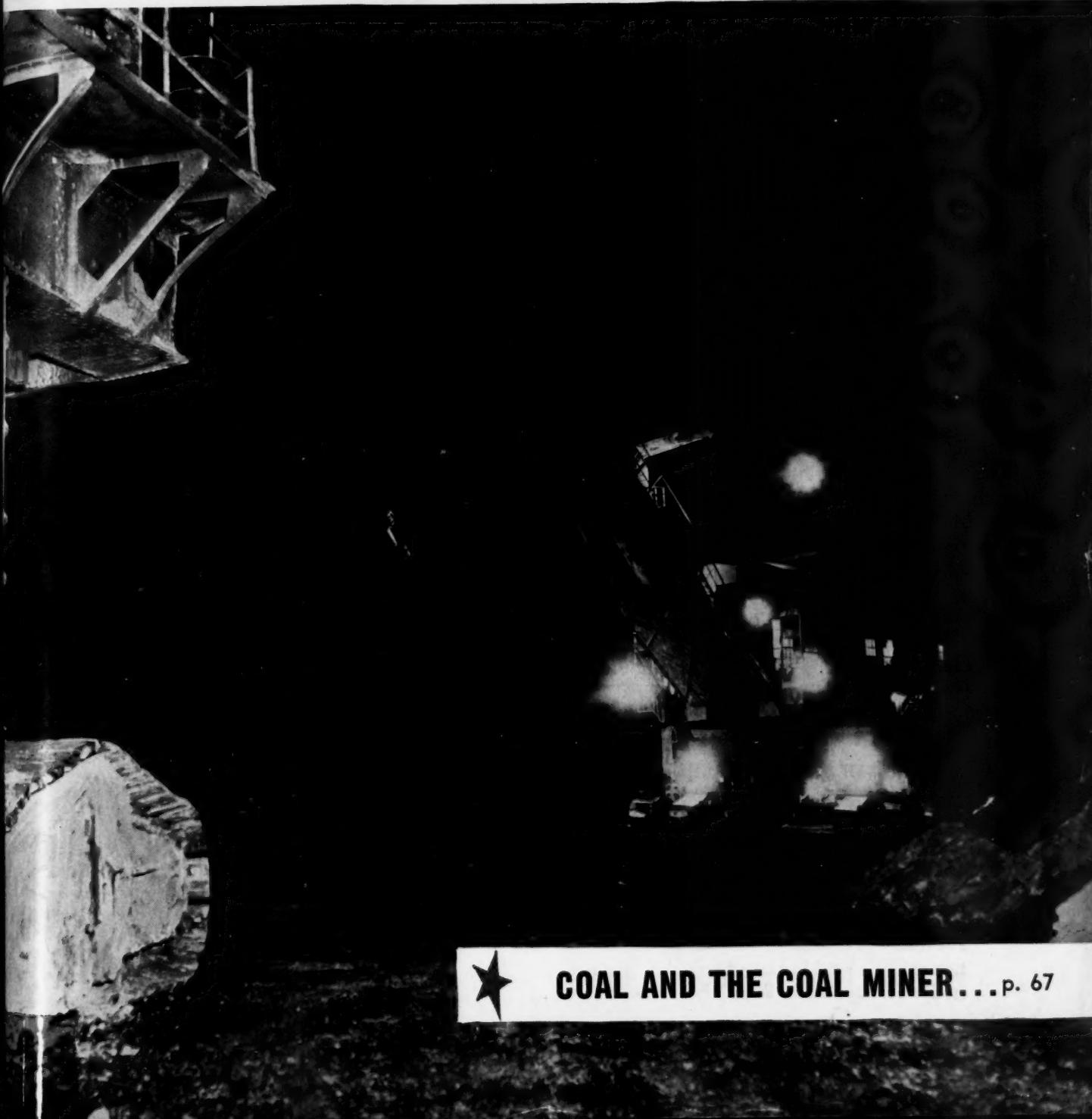


# Coal Age

ED., 1946

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COAL AND THE COAL MINER... p. 67



## Saves \$2400 ON MAINTENANCE

### SUN COMPRESSOR OIL...

Doubles Life of Valves and Rings in 2 Compressors, Ends Frequent Breakdowns Due to Heavy Carbon Deposits

A well-known company recently estimated a saving of \$2400 after switching to a Sun oil for lubricating two compressors.

**Heavy deposits of carbon** on valves and piston rings had made maintenance of these compressors a chronic headache and expense.

A Sun Engineer recommended a "Job-Proved" Sun oil that is specially refined from low-carbon stock and widely used throughout industry for compressors of this type. With this oil the life of valves and rings doubled, and management estimated they had saved \$2400 on maintenance alone.

This saving and this plant, which is now 100% lubricated by Sun, are typical of hundreds of cases where Sun Engineers and Sun "Job-Proved" products have helped to eliminate shutdowns, to cut maintenance costs, and to keep production on a continuous basis. Call the nearest Sun office for Sun "Job-Proved" service.

**SUN OIL COMPANY • Philadelphia 3, Pa.**  
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**SUNOCO**  
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**PRODUCTS**



*A development of*  
**B.F. Goodrich**  
**FIRST IN RUBBER**

## They dig a lake to float a boat that never sails

*A typical example of B. F. Goodrich development in rubber*

UNDER that placid lake is a gold mine busily at work. At the spot picked by experts, miners dig a lake and build a dredge on it. Then gravel is scooped up from the lake bottom, the gold separated, and the worthless gravel dumped out of the way.

The toughest job is to get rid of the gravel. Conveyor belts were tried but the gravel is so wet it slipped down faster than the moving belt could carry it up and away.

Before the war B. F. Goodrich engineers began work on some method

of solving the problem. They built a trough of boards, inclined as the belt is, in use, and poured whitewash into it, studying the travel of the whitewash down the slope.

Gradually they developed a pattern of belt surface—a series of ridges—which held the gravel but let the water run off to the sides.

A belt was built with this surface pattern, tried, and worked perfectly. The grooves last the full life of the belt. This new B. F. Goodrich "Riffle Top" belt, as it has been named, is now at

work in gold mines and other work where wet, slippery material must be carried up steep grades. It will make many mining and construction jobs cheaper, more efficient—typical results of B. F. Goodrich research and the reason it pays to find out what improvements B. F. Goodrich has made since the war in any rubber product you use. *The B. F. Goodrich Company, Industrial Products Division, Akron, Ohio.*

**B. F. Goodrich**

RUBBER and SYNTHETIC products

# First in its Field...



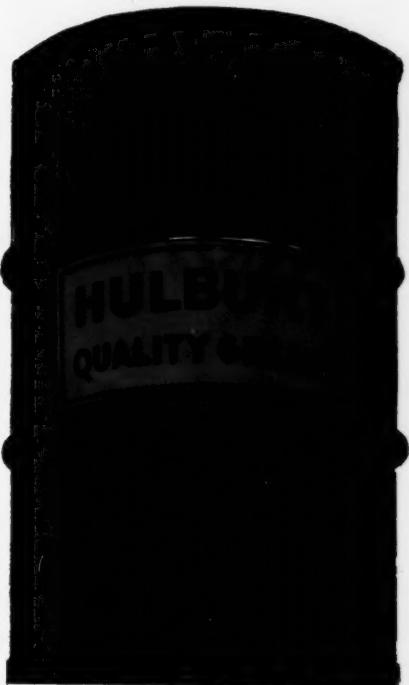
**"MERRY CHRISTMAS!"**  
says the First Statue of SANTA CLAUS

Yes, there is a Santa Claus! Here is his first and only statue, dedicated to the children of America, in Santa Claus Park, Santa Claus, Indiana. Tons of mail are sent annually to the little town at Christmastime to be remailed with the Santa Claus postmark, and treasured by children forever.

HULBURT OIL & GREASE COMPANY—PHILADELPHIA, PENNA.

*Specialists in Coal Mine Lubrication*

*..a record of*  
*American Leadership*



"Merry Christmas!"

says

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**What every Hazacord offers . . .**



**when you select**

## **PORTABLE CORDS AND CABLES**

From the smallest size to the largest — *all* Hazacord Portable Cords and Cables are *pressure cured* in *continuous* metal molds — a Hazard process that provides maximum jacket density . . . extra surface smoothness . . . more all around resistance to mechanical damage in normal mining use or even under abuse. In short, no matter what size portable cord or cable you need, select a Hazacord and count on getting longer, more dependable service — the kind that reduces operating costs.\* Hazard Insulated Wire Works, Division of The Okonite Company, Wilkes-Barre, Pa.



**AMPLE FLEXIBILITY** is inherent with Hazacords because numerous copper wires are skillfully stranded to form the conductors.

\***ADDITIONAL PROTECTION THAT PAYS OFF** is also yours with every Hazacord size 8AWG and larger because a Hazaprene jacket is provided. Hazaprene successfully resists such destructive agents to ordinary rubber as oil, grease, water, chemicals, acids, etc. . . . is flame-resisting (Penna. Bureau of Mines Approval No. 104). When specified, a Hazaprene jacket can be had on Hazacords smaller than 8AWG.

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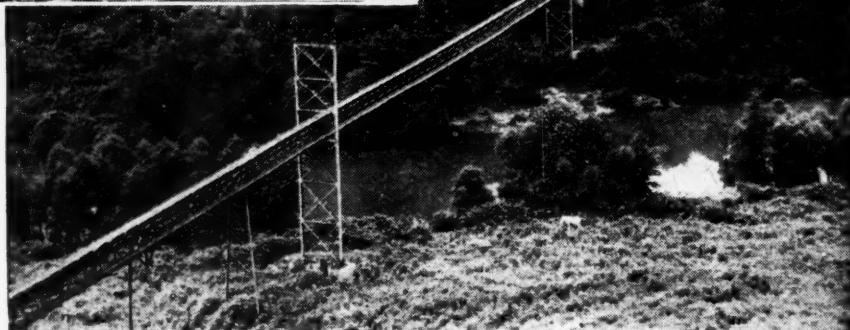
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# Kentucky to West Virginia on a Continental Conveyor



200 Tons  
an Hour of  
Run-of-mine Coal  
Carried 680 Feet  
at 200 Feet  
a Minute



## Continental Idlers

A complete line of Troughing, Flat Belt and Picking Table Idlers, Timken or SKF equipped, for belts 14 to 60 inches wide. Also a complete line of accessories, including Trippers, Pulleys, Take-ups, Drives, etc.

Write for Bulletin ID-105

When the Belfry Coal Company opened a new mine in Kentucky, they were faced with the problem of hauling the coal across the Tug River to the C & O Railroad in West Virginia. Many methods were considered, but it soon became apparent to company engineers that a belt conveyor carried on a suspension bridge was the most practical solution.

Continental engineers then designed the system pictured above on which run-of-mine coal is

uniformly fed by an apron feeder onto the 36" belt conveyor—sped across the river at 200-FPM to the tipple on the opposite embankment.

This is typical of the manner in which Continental engineering is assisting industry in solving their materials handling problems.

Many industries are taking advantage of our present day stocks to build complete conveyors. Send us your orders or inquiries.

100A

## INDUSTRIAL DIVISION CONTINENTAL GIN COMPANY

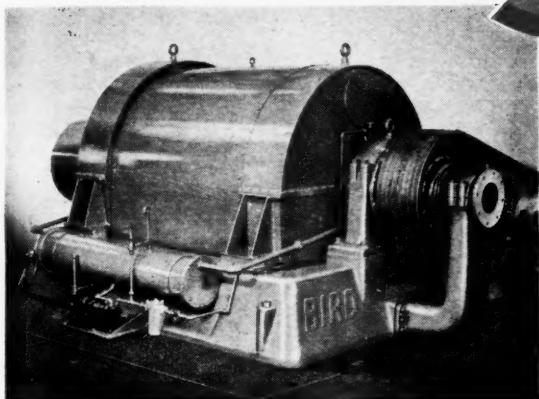
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**—and do it better and at lower cost,  
month in and month out without a  
shutdown for maintenance.**

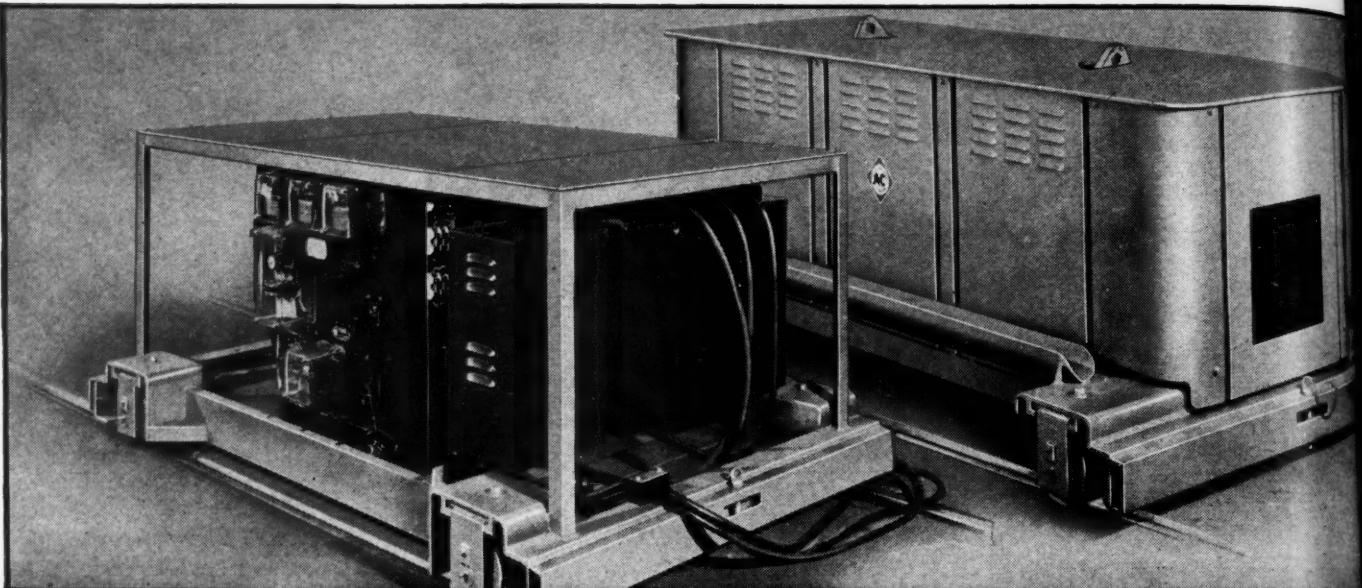
This Bird Centrifugal Filter teams up with any cleaning system to deliver the fines dry and whole, ready for blending. The water is so clean it's ready for immediate re-use.

One small BIRD handles 40 tons or more per hour at exceedingly small over-all cost. It runs for months on end without parts replacements or overhaul. Isn't *that* something?

To find out exactly what this remarkable unit can do for you, get in touch with Bird Machine Company, South Walpole, Massachusetts.

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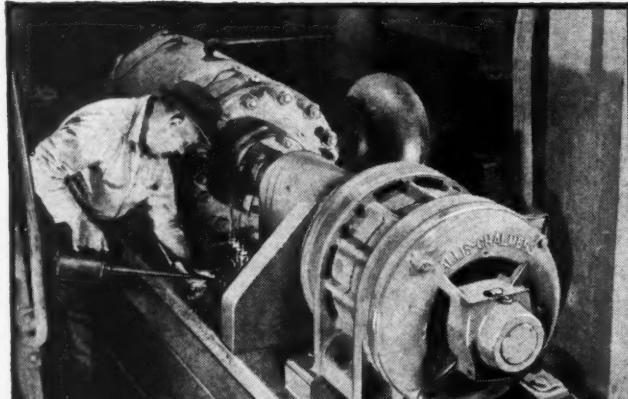


## A-C TO D-C POWER CONVERSION

PUT POWER RIGHT WHERE YOU NEED IT MOST! Mobile a-c to d-c power conversion boosts face voltage, can result in as much as a 10% increase in output per man on cutting crews! The Allis-Chalmers portable 3-car Excitron Unit Substation provides service continuity... assures a steady, dependable source of power

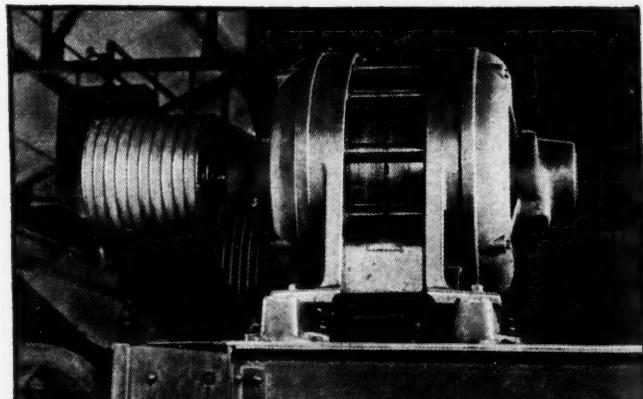
at load centers underground. The complete Excitron unit consists of an a-c car equipped with a 2300 or 4000 volt air circuit breaker, a rectifier transformer car designed to eliminate strain on core and coils, and a d-c car with rectifier tube heat exchanger, control panel, and auxiliaries.

# Recommended ...



VACUUM PUMPS

ROTARY VACUUM PUMPS are being used increasingly with vacuum filters in coal preparation and cleaning plants. Installation shown above is a compact Allis-Chalmers Type WS single-stage unit rated 1590 cfm at 26 hg, direct-connected to filter. Rotary pump has very economical, non-pulsating operation... requires no cushioning device... handles more air at less cost! BULLETIN B6211.

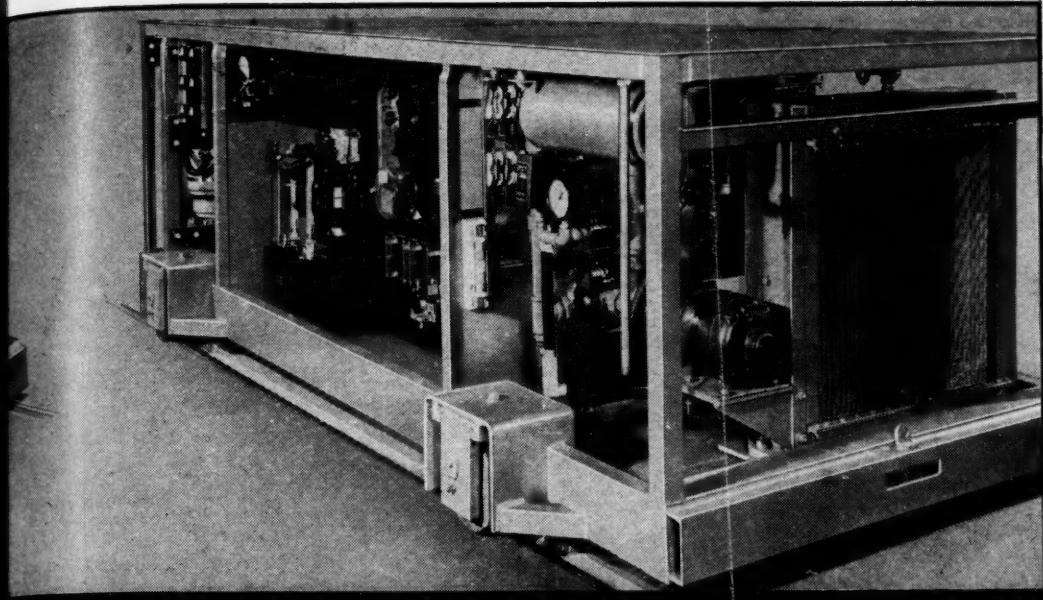


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ALLIS-CHALMERS MOTORS AND TEXROPE DRIVES are a combination that will deliver efficient, dependable power... despite tough operating conditions. Totally enclosed, fan-cooled Allis-Chalmers motors may be obtained for particularly dusty, gritty locations. Tough Super-7 v-belts resist wear, essentially eliminate the possibility of belt failure. BULLETINS B6052F AND B6051F.

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One of the Big 3 in Electric Power Equipment—Biggest of All in Range of Industrial Products



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Coal  
Operators

### 3-CAR MOBILE MINE UNIT

Excitron is an all-automatic power conversion unit that saves copper and power... is capable of carrying loads of 150% for two hours. It's furnished with modern protective equipment for highest safety standards, and can be obtained with either open or enclosed construction, as shown above. Base construction of cars provides for adjust-

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Simple...Flexible... Foolproof — the Allis-Chalmers mobile Excitron Unit Substation is built ruggedly for long, trouble-free service... will give you compact power that keeps face voltages up — resulting in substantially reduced production costs.

# by Coal Experts!



### PROCESSING EQUIPMENT

HIGHER COAL DEWATERING EFFICIENCIES can be obtained with the Allis-Chalmers End-Tensioned Deck on Low-Head or Ripl-Flo vibrating screens. Longitudinal tensioning of screen surfaces results in coal being distributed evenly over all of the screening area. You get better dewatering efficiency... greater economy... increased capacity. Send for BULLETIN B6321.

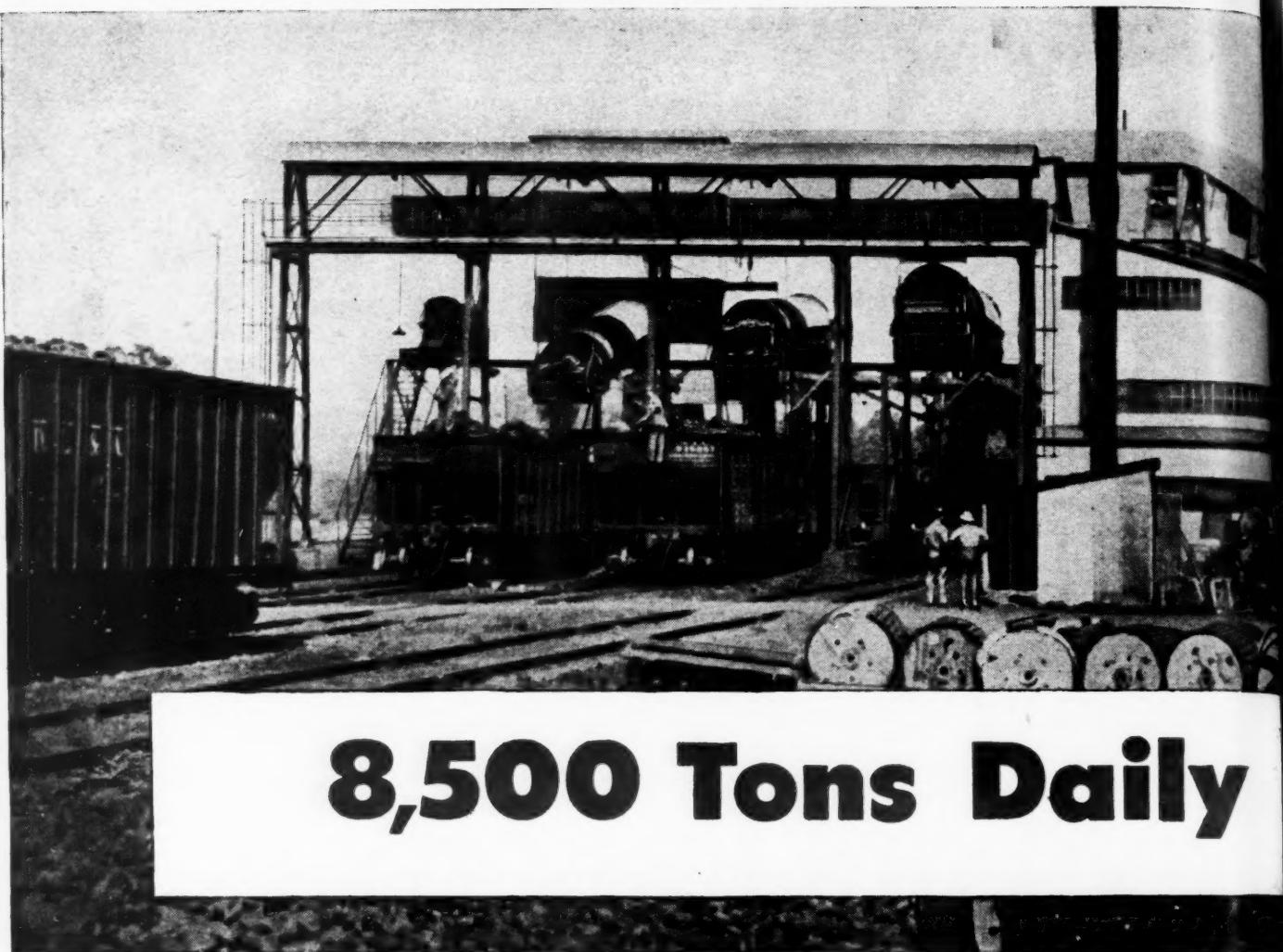
### ALLIS-CHALMERS EXAMINES EQUIPMENT PROBLEMS FROM AN INDUSTRY ANGLE

WHEN YOU CALL IN an "Allis-Chalmers man" you get the practical helpfulness of a *coal expert* who knows just how and where Allis-Chalmers equipment can help increase tonnage and cut costs. He understands *your* equipment problems. What's more, he has an *industry-conscious* organization behind him.

Yes, working with your Allis-Chalmers man is a group of coal industry specialists who are continuously working on a long-range program of product development and improvement. Many Allis-Chalmers products have been engineered and developed specifically for the coal industry. Get *expert* equipment recommendations from the A-C representative nearest you. ALLIS-CHALMERS, MILWAUKEE 1, WIS.

A 2074

# ...builds for COAL



## 8,500 Tons Daily

EIGHT thousand five hundred tons a day is a lot of coal from a newly opened mine. But that's the current output of the Muskingum Coal Company's completely conveyorized Misco Mine — where slope entries were begun in December, 1944. And with a seam averaging 50 inches thick, 12,000 tons is anticipated.

Even this jump in production will be easily handled by the Goodyear "Coal-Flo" conveyor belt system which runs from rooms to tipple. Coal is brought out from three main entries on 26" "Mother" belts. At the base of the 330-foot slope it feeds onto a trio of 28" slope belts which carry it to the tipple. Five other Goodyear belts distribute coal from there to the screens and loading dock.

Mr. Earl Jones, President of the Muskingum Company, reports that some of these belts served as long as six years in other company mines, handled as much as five million tons of coal, before being installed at Misco. Yet, all

are still in excellent condition, and far greater tonnages are expected from them.

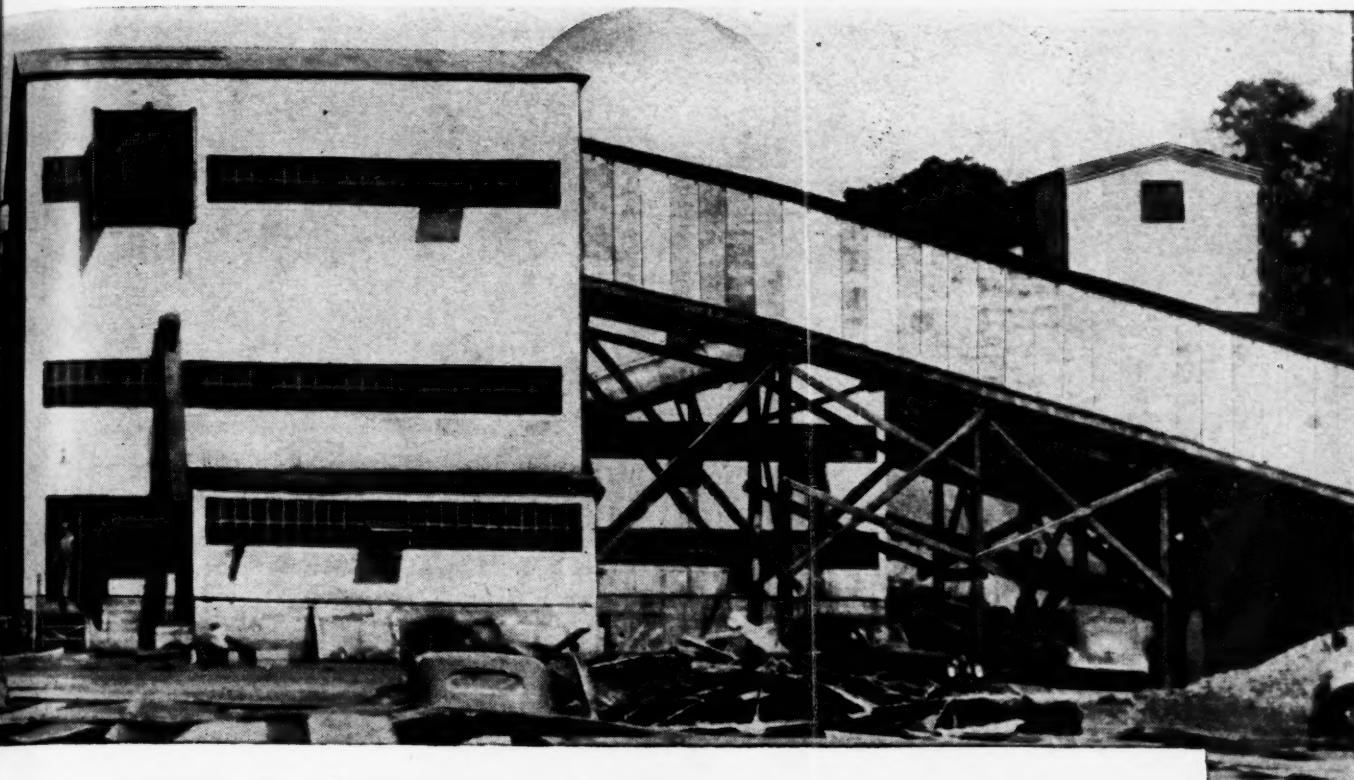
### Higher tonnage — lower cost

This operation underlines once again the streamlined, money-saving efficiencies to be achieved with Goodyear "Coal-Flo" conveyor belts. They're longer-lasting because they're specially constructed to resist cutting and abrasion. They're mildew- and acid-inhibited.

Moreover, an exclusive formula devised by the G.T.M. — Goodyear Technical Man — insures correct troughing indices for all widths and thicknesses of belting. That means proper "training" and good steering — another reason for the longer life and higher tonnage capacities of these belts.

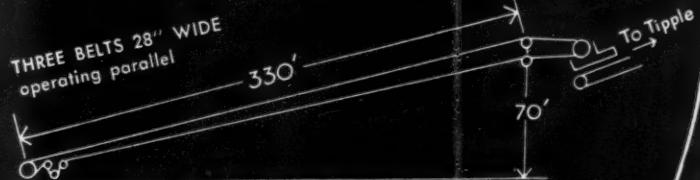
These are a few of the advantages that make "Coal-Flo" conveyors a must, if you want the lowest-cost underground transportation. The G.T.M. will be glad to give you additional details. To consult him, write: Goodyear, Akron 16, Ohio or Los Angeles 54, California.

"Coal-Flo" — T.M. The Goodyear Tire & Rubber Company



## Y on "Coal-Flo" Belts

GOODYEAR INDUSTRIAL RUBBER PRODUCTS  
G - Specified  
"COAL-FLO" Conveyor Belt System  
for  
SLOPE ENTRY  
MUSKINGUM COAL COMPANY

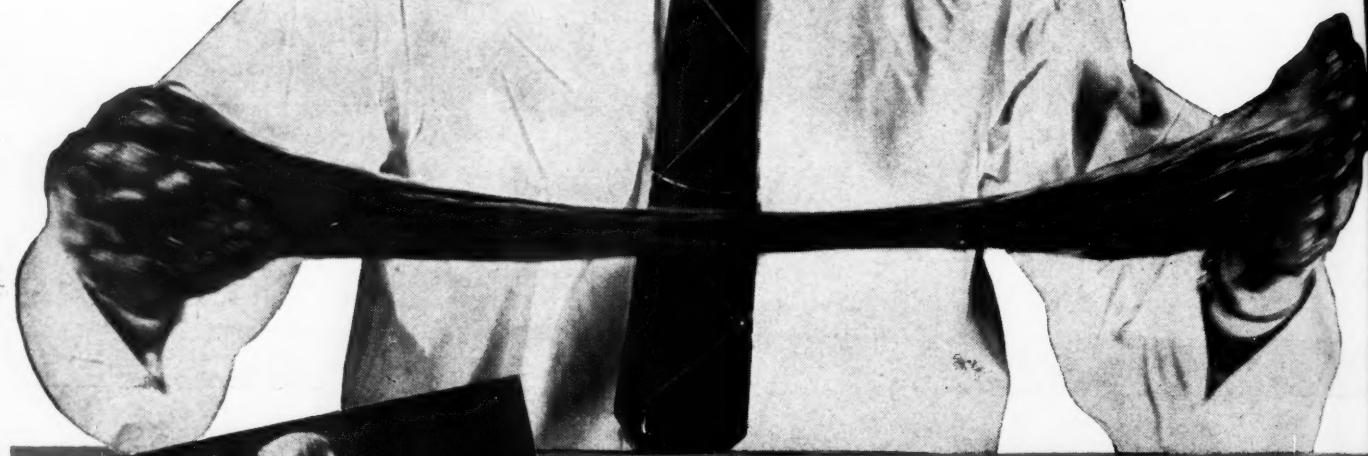


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# GOOD YEAR

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MARFAK IS COHESIVE. See how Marfak holds together — s-t-r-e-t-c-h-e-s. Seals out dirt and moisture — protects parts longer.



The collage consists of three black and white photographs. The left photo shows a man holding a piece of ordinary grease that has separated into two distinct pieces. The middle photo shows a man holding a piece of Marfak lubricant that remains intact even after being hit with a hammer. The right photo shows a close-up of a bearing that has been splattered by ordinary grease hitting it.

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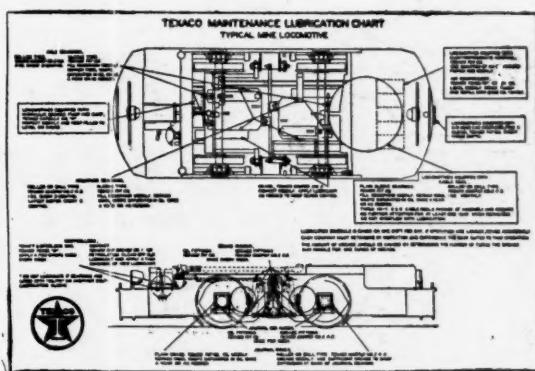
Use *Marfak* to lubricate heavy-duty bearings — plain or anti-friction — and you'll assure smoother operation, lower maintenance costs, and longer life for your equipment. There's added economy, too, in the ability of *Marfak* to give greater protection with fewer applications.

Because of the benefits it brings, *more than 250 million pounds of Marfak have been used!*

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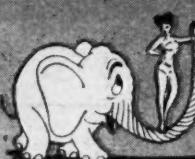
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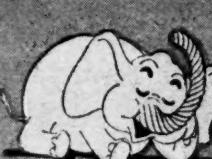
## union-formed For Long Lived **PERFORMANCE**



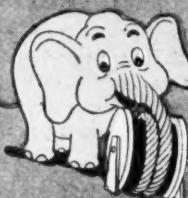
**UNION-FORMED  
SPOOLS BETTER**  
... even with a  
light load it winds  
evenly and tightly.



**UNION-FORMED  
RESISTS KINKING**  
... because wires and  
strands are free of in-  
ternal stress, they do not  
tight to get out of their  
preferred positions.

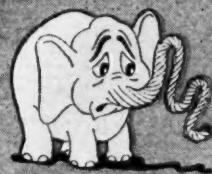


**UNION-FORMED HAS  
GREATER RESISTANCE  
TO BENDING FATIGUE**  
... withstands more  
bends, even reverse  
bends, because it is  
more stress-free, like  
a nelly.



**UNION-FORMED RIDES  
BETTER ON GROOVES**  
... does not spin over  
sheaves or grind  
through blocks.

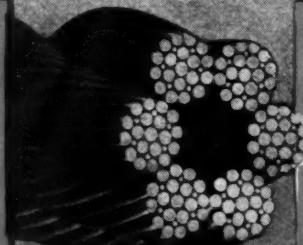
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... worn, broken wires  
do not spring out and  
porcupine but can  
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the rope.



**UNION-FORMED IS  
FLEXIBLE and RELAXED**  
... bends in any direc-  
tion, yet has "tough-  
ness" to withstand jerk-  
ing and other punishing  
strain.



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*(Preformed)*



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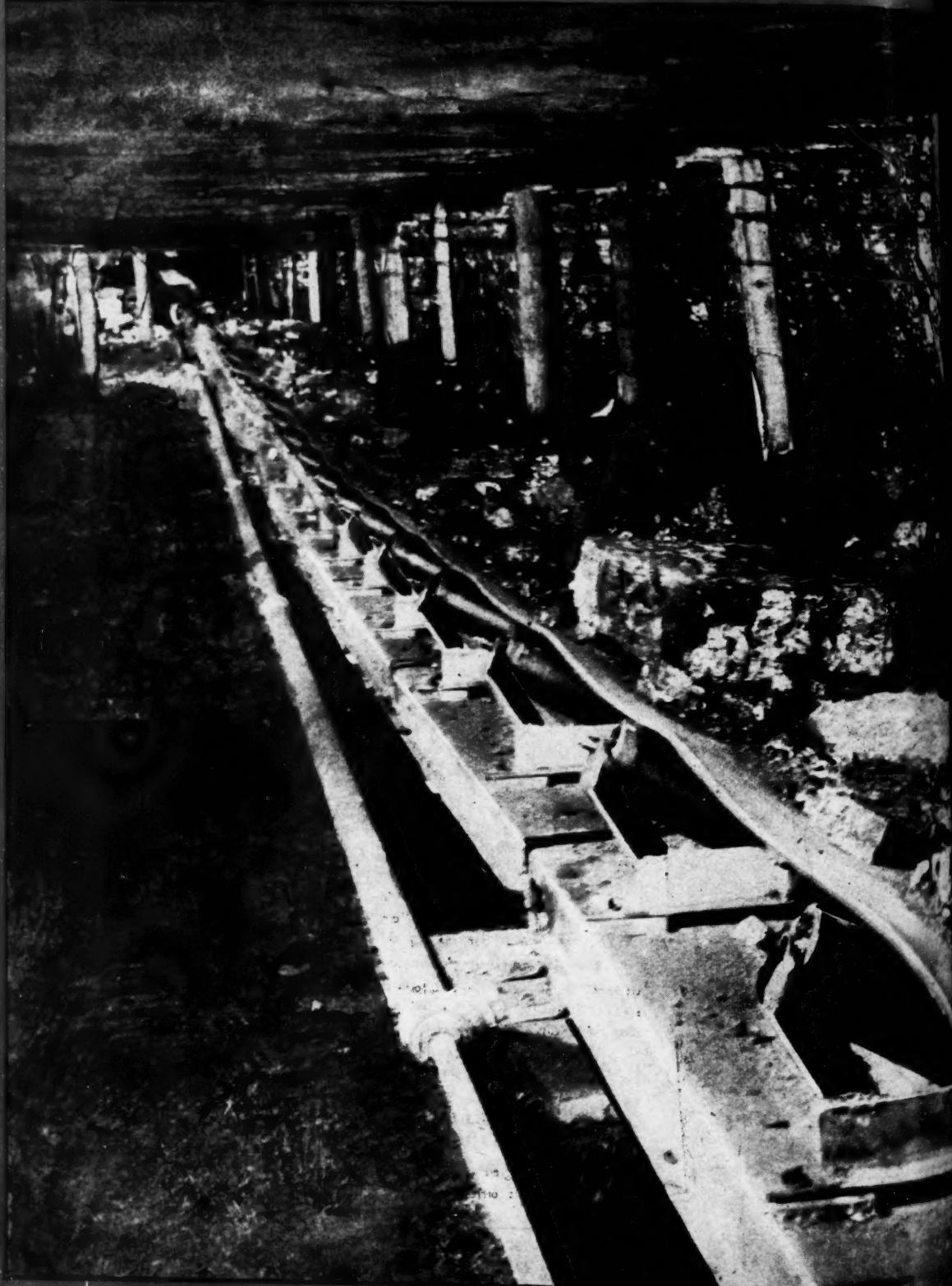
- Rope Dope No. 1
- Splicing Wire Rope
- Steel Tendons of Industry
- Wire Rope Lubrication
- Correct Handling of Wire Rope
- Socketting Wire Rope
- Mining Rope Special
- Slusher Rope Special
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Firm Name \_\_\_\_\_

Address \_\_\_\_\_

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A complete line of belt conveyors  
to meet every mine condition and  
capacity requirement.

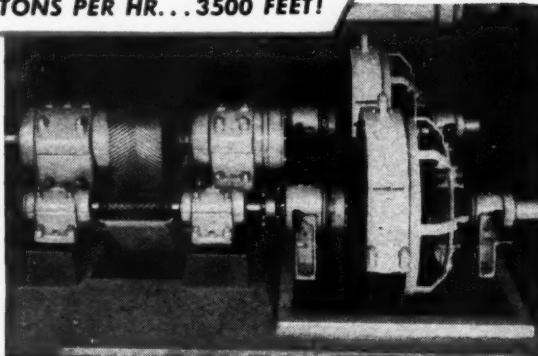




GOODMAN MANUFACTURING COMPANY • CHICAGO, ILLINOIS

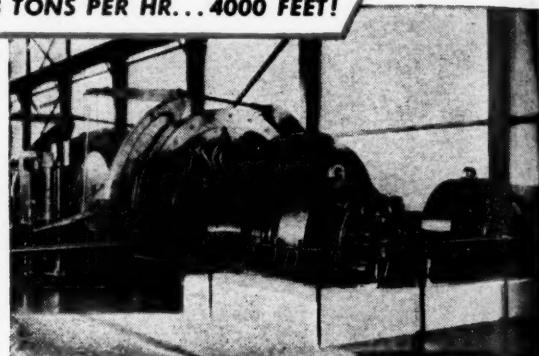
# HIGH-SPEED HOISTS SET N

360 TONS PER HR...3500 FEET!



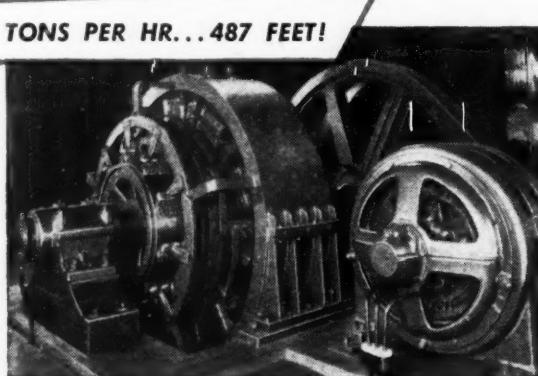
Two G-E amplidyne-controlled hoist drives serve a mine in northern Michigan. The main ore hoist is rated 3000 hp and at a speed of 2400 feet per minute, carries 360 tons per hour from a depth of 3500 feet.

408 TONS PER HR...4000 FEET!



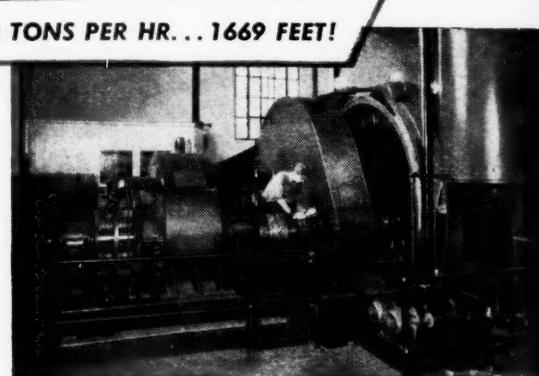
A mine in the Adirondacks uses three G-E amplidyne-controlled hoists. One, utilizing two 1000-hp d-c motors is shown above; It shifts 408 tons per hour from a level of 4000 feet at a speed of 2000 feet per minute.

750 TONS PER HR...487 FEET!



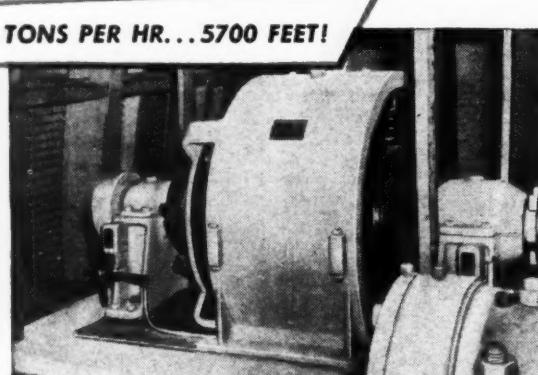
This mine hoist in the soft coal fields of Pennsylvania is driven by a G-E 1250-hp motor, amplidyne-controlled. It brings 750 tons of coal to the top every hour from a depth of 487 feet. Hoist speed hits 2900 feet per minute.

280 TONS PER HR...1669 FEET!



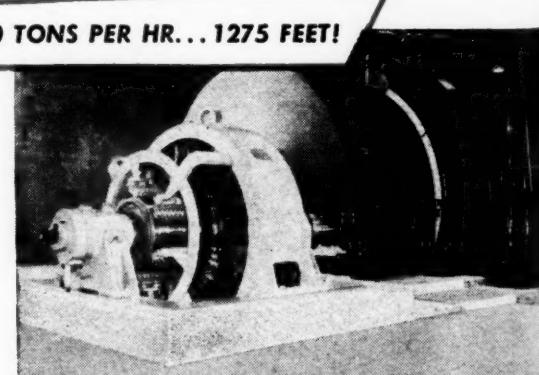
This main hoist at an iron mine is powered by a G-E 1000-hp d-c motor, amplidyne-controlled. Smooth control of the hoist brings up 280 tons per hour at this mine.

143 TONS PER HR...5700 FEET!



One of two 600-hp G-E hoist drives installed at a lead and zinc mine in the West. Fast acceleration and deceleration is necessary to raise 143 tons of ore per hour from a distance of 5700 feet.

390 TONS PER HR...1275 FEET!



An iron mine keeps the main hoist in its 1275-foot mine moving at a speed of 1500 feet per minute with a G-E amplidyne-controlled drive motor, rated 1250 hp. Hoist load is 390 tons per hour.

**GENERAL ELECTRIC**

657-55-169

# NEW TONNAGE RECORDS

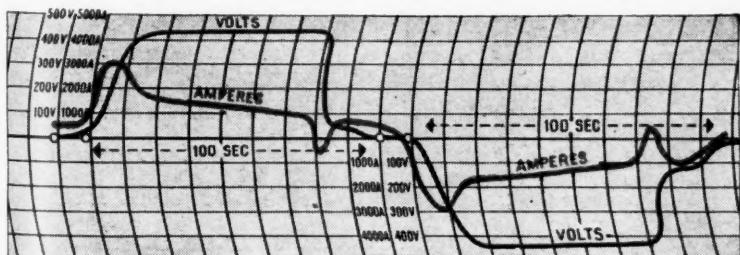
G-E amplidyne hoist control gives these mine operators more trips per hour with capacity loads... the simple way.

Since 1941, more than 20 G-E amplidyne-controlled hoist drives have been installed at almost every type of underground mine. Performance is improved—tonnage handled is up! The shaft is no longer a bottleneck. Maintenance problems are minimized.

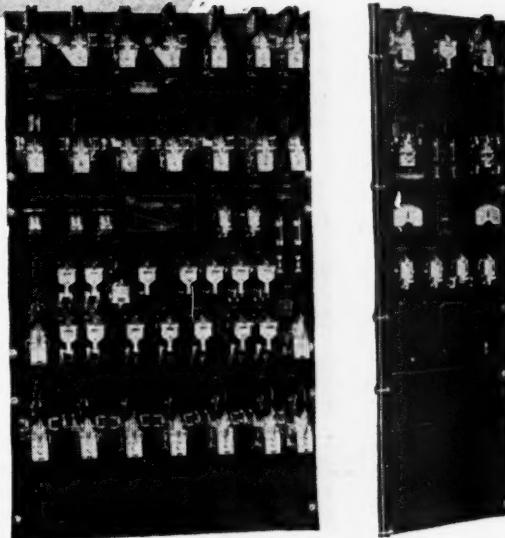
**FAST STARTS—QUICK STOPS** The outstanding characteristics of an amplidyne-controlled drive are FAST acceleration and FAST deceleration. The time required by the drive to "level out" at a high running speed or drop to a complete standstill is short. High-speed hoist operation is thus made practical by the accurate and positive control of the G-E amplidyne.

**SMOOTH CONTROL ALWAYS!** On the chart below you'll notice the smooth acceleration under positive current limit—a result of G-E amplidyne-controlled hoist drive. A safe current limit is quickly reached and rigidly maintained by the amplidyne; the speed is nearly constant throughout the lift. Mechanical stresses are greatly reduced and equipment is fully protected.

Whether you're thinking of modernizing an old hoist or installing a new unit, you'll be interested in the data a G-E application engineer can give you. Why not get in touch with your nearest G-E field office? *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*



**FAITHFUL RESPONSE** of mine hoists to control operation is provided by the G-E amplidyne. The amplidyne is a high ratio (up to 10,000 to 1) exciter for the hoist generator driven at constant speed by a motor. The operator manipulates but one field to obtain complete control of the fastest mine hoist, in this simplest of all hoist control systems. The controlled output of the amplidyne serves to regulate generator voltage to the main hoist motor. FREE booklet gives full information on the amplidyne. Ask for Bulletin GEA-4053, Section 657-55, General Electric Co., Schenectady 5, N. Y.



**OLD** system—this control board (left) for a large hoist is burdened with a large number of contactors and relays.

**NEW** system—amplidyne takes over, a few small relays are substituted and panel cut to this size (right). Needs little attention, operation is simplified, and upkeep costs are reduced.

This chart shows typical volt-ampere characteristics afforded by a G-E amplidyne control system with a hoist operating from a flywheel motor-generator set. Note positive accelerating current limit, smooth acceleration and maintenance of full speed.



**Amplidyne-Controlled  
Hoist Drives**



**Faster loading  
Fewer shutdowns  
with . . .**

**IMPROVED  
STANOIL**

DO SHUTDOWNS for maintaining loader hydraulic systems cut into your production? Stanoil will help you eliminate these time-consuming interruptions . . . will help your operators load out more coal for each machine.

Stanoil is designed to fight heat and vaporization . . . developed in hydraulics when loaders are operated continuously at high capacity.

Since Stanoil does not thin out excessively at high temperatures, it gives good hydraulic response. Stanoil resists oxidation, and chemical changes that cause oil deterioration; thus it reduces deposits and minimizes sluggishness in the systems. Cleaner systems and less viscosity change also mean less wear and maintenance.

Ask a Standard Oil Lubrication Engineer for a test of Stanoil—prove its advantages in your own loaders. Write the Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois, for the Engineer nearest you.

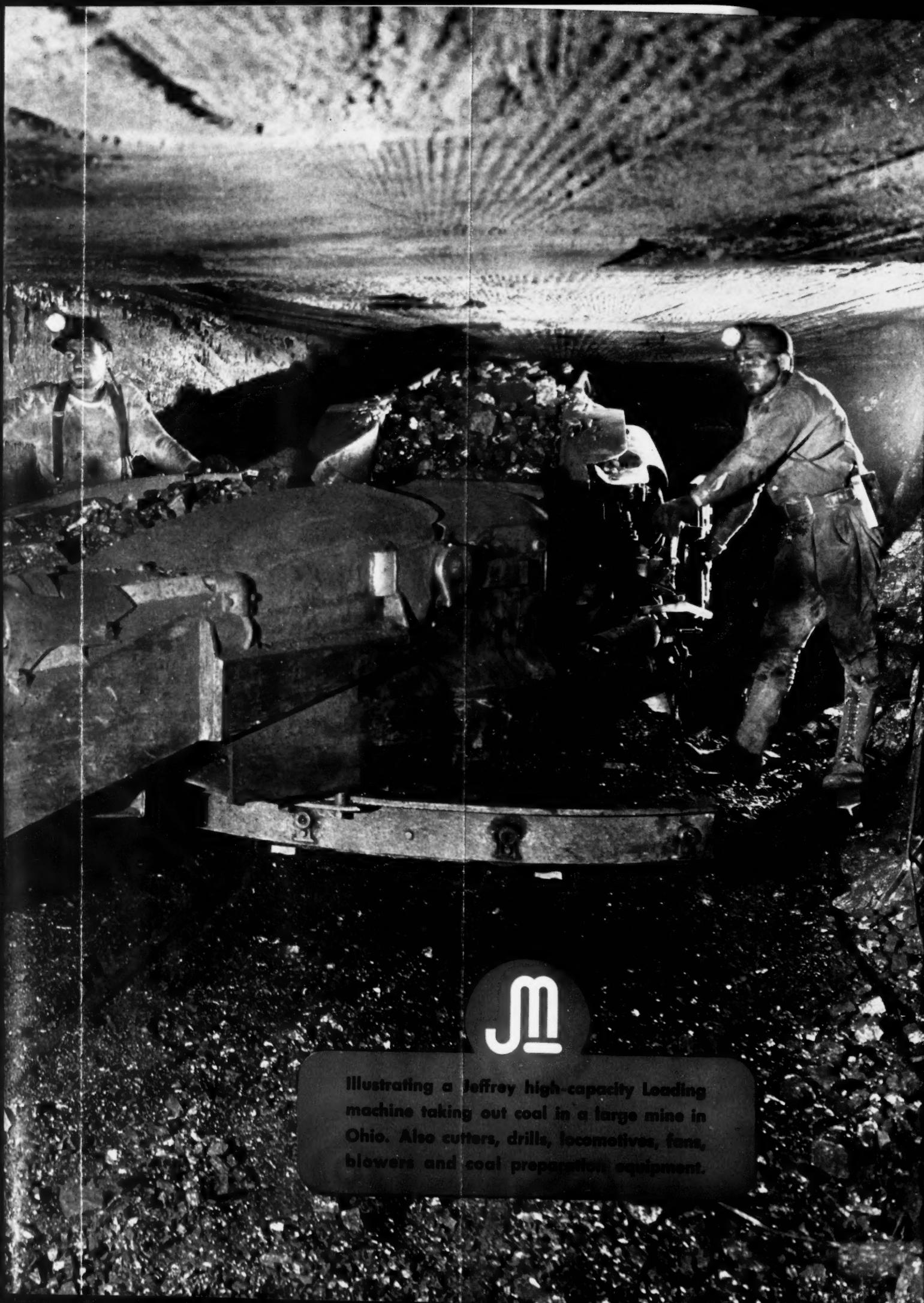
**STANDARD OIL COMPANY (INDIANA)**

**STANDARD  
SERVICE**

systems  
eliminate  
help your  
on...de  
continu  
high tem  
oil resis  
eteriora  
gishnes  
y change  
a test o  
rs. Writ  
Michigan  
rest you

STANDARD  
SERVICES





Illustrating a Jeffreys high-capacity Loading  
machine taking out coal in a large mine in  
Ohio. Also cutters, drills, locomotives, fans,  
blowers and coal preparation equipment.







# JEFFREY LOADERS... Track Mounted

(Patented)

- One of the reasons that Jeffrey Loaders can take the punishment to which they are subjected in actual service is that they are ruggedly built by skilled men rich in experience in the construction of mining equipment.

These Jeffrey employees know that Jeffrey quality goes deeper than the mere parts they assemble into a finished machine. They also know that it is their "expert knowledge", plus careful workmanship, that keeps Jeffrey loaders producing low cost coal over long periods for our many customers.

We are happy to give recognition to these men inside our plant, whose untiring efforts are largely responsible for the success of Jeffrey equipment and mine operators' satisfaction.



T

Sale

Serv

For



# Jeffrey

## EQUIPMENT FOR COAL MINES

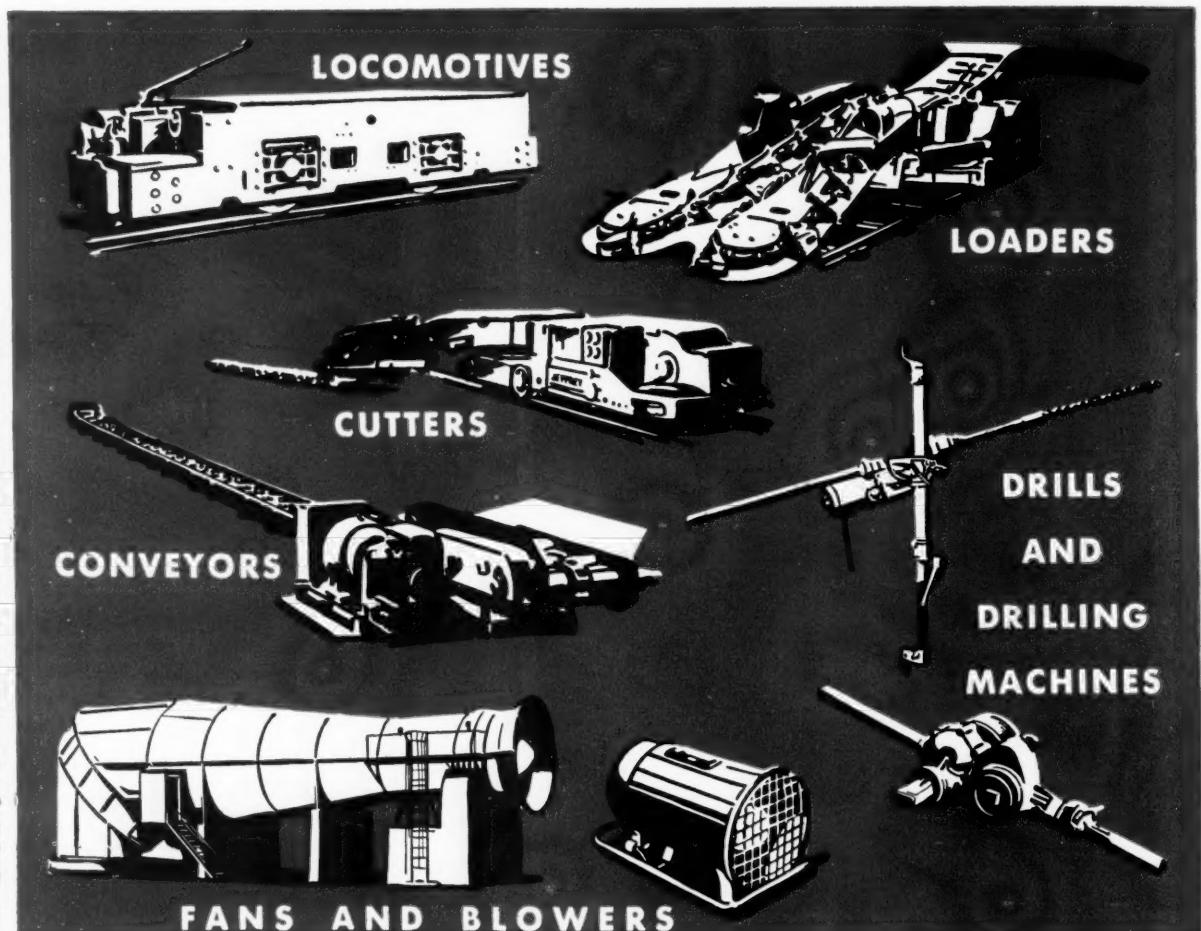
JEFFREY SERVICE TO THE COAL MINES  
MEANS SERVICE TO ALL INDUSTRY

mounted

take the  
service is  
xperience

es deeper  
machine,  
ge", plus  
roducing  
customers.

aside our  
e for the  
satisfaction.



### THE JEFFREY MANUFACTURING COMPANY

*Established in 1877*

912-99 NORTH FOURTH STREET, COLUMBUS 16, OHIO

Sales Offices:

Baltimore  
Birmingham  
Boston  
Buffalo

Chicago  
Cleveland  
Cincinnati  
Detroit

Denver  
Harlan  
Houston  
Huntington

Milwaukee  
New York  
Philadelphia  
Pittsburgh

Scranton  
St. Louis  
Salt Lake City

Service Stations:

Pittsburgh  
Harlan, Ky.

Birmingham  
St. Louis

Logan-Beckley  
W. Va.

Scranton

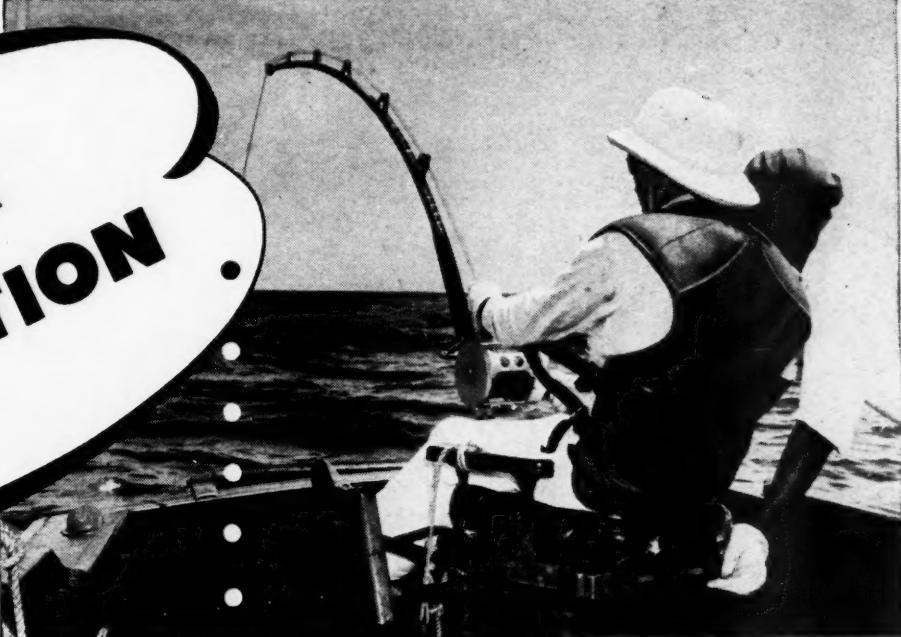
Foreign Plants:

Jeffrey Mfg. Co., Ltd.  
Montreal, Quebec

British Jeffrey-Diamond, Ltd.  
Wakefield, England

Jeffrey-Galon (Pty), Ltd.  
Johannesburg, S. A.

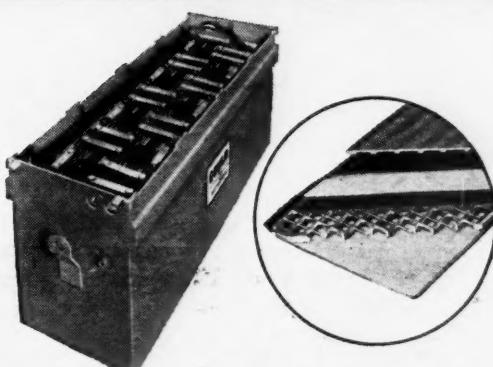
**EXTRA  
PROTECTION**



### Gould Batteries Give Extra Protection

In Gould Kathanode Batteries all useful active material is retained in the grid

Just as deep sea fishermen wear a special harness to absorb the pull of big fish, so is Kathanode reinforced against the strains of charging and discharging in mine shuttle car service. For Kathanode this extra protection maintains capacity throughout the entire service life of the battery.



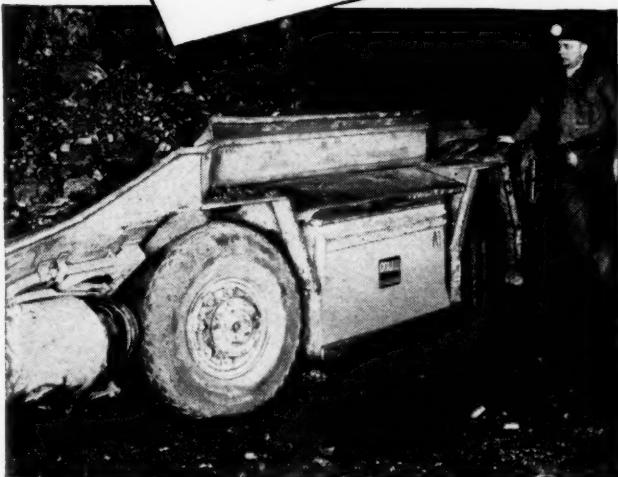
*and here is the Reason why -*

In Gould Kathanode each positive plate is faced with spun glass mats, held in place by a porous rubber envelope. This is the famous Kathanode Unit. It keeps the active material in place until it is entirely spent, where without this special construction the oxide would flake off before being spent, and settle to the bottom. Prove this yourself by comparing the sediment in a Gould battery with any other battery not having glass mats.

Get all the facts on Gould. Write Dept. 1112 for Catalog 300 on Gould Kathanode Glassklad Batteries for Mine Shuttle Car Service.

**GOULD  
KATHANODE  
BATTERIES**

GOULD STORAGE BATTERY CORPORATION, Depew, N. Y. Service Centers: Atlanta • Boston • Buffalo • Chicago • Cincinnati • Cleveland • Detroit • Kansas City • Los Angeles • New York • Philadelphia • Pittsburgh • St. Louis • St. Paul • San Francisco • Seattle • Zanesville





**GOOD  
HUNTING**  
*in any  
formation*

**SULLIVAN  
CORE DRILLS**  
**fast, accurate, economical  
for all exploratory work**

To analyze sub-structures 400 feet or 12,000 feet underground, get a true core at top speed with a Sullivan Core Drill. Field tested in every type formation, they're proved time and money savers.

Write today for bulletins that give full information about this world's largest family of core drills. All drills are supplied with screw or hydraulic feed, can be powered by gasoline, diesel, electric, air or steam.





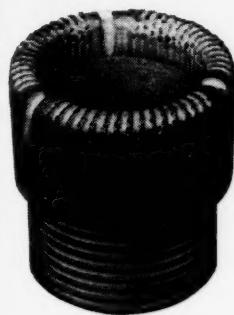
## LIGHT WEIGHT SULLIVAN No. "12" CORE DRILL

Portable, with steel castings,  
alloy steel gears and shafting.  
Up to 1750 RPM spindle speeds.



## HEAVY DUTY SULLIVAN No. 22 HD CORE DRILL

Rugged, compact and portable.  
Conservatively rate at 1750  
foot capacity with "E" rods.



### SUL-SET CORE BITS AID SPEEDY DRILLING

Modern bortz bits with  
patented ridge design  
keep bit in contact with  
uncut rock, assures  
cooler, smoother drilling.

### CONTRACT CORE DRILLING BY SULLIVAN

Experienced crews and complete core  
drilling facilities are at your service  
for economical contract core drilling  
on a price per foot basis.

Write for  
Bulletin or  
Consult a  
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SULLIVAN DIVISION  
**JOY MANUFACTURING CO.**

JOY MANUFACTURING CO., INC.  
THE W. OLIVER BUILDING, PITTSBURGH, PENNA.

W&D C615

# U-S-S Amerclad Type GPS

## HAS EVERYTHING FOR COAL



You can drag it  
over rocks



You can bury it  
in mud and sand

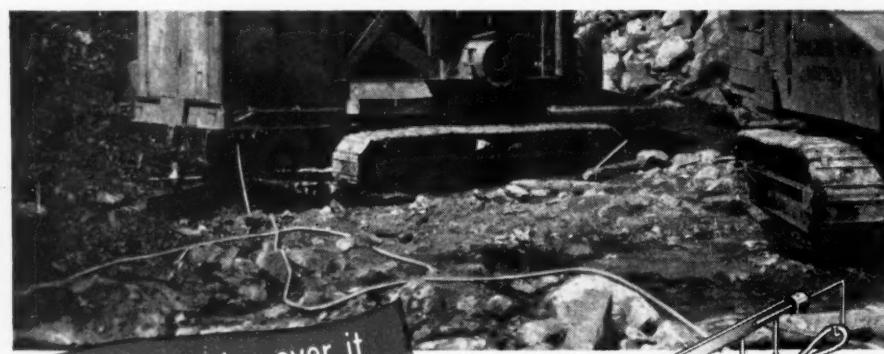


You can soak it in  
corrosive mine water

Its neoprene "rubber armor" is as tough as truck tires . . . will stand years of scuffing and scraping. Type PS Shielding plus ground wires insures utmost in safety and maximum electrical endurance.

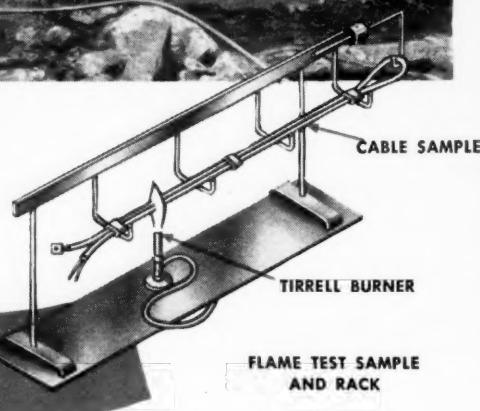
Synthetic neoprene was engineered to resist corrosion, acids, oil, grease . . . and especially the destructive conditions found in most mines.

Strip mining and the mud that goes with it is just another job to this rugged cable . . . for it is unaffected by abrasion and exposure to moisture.



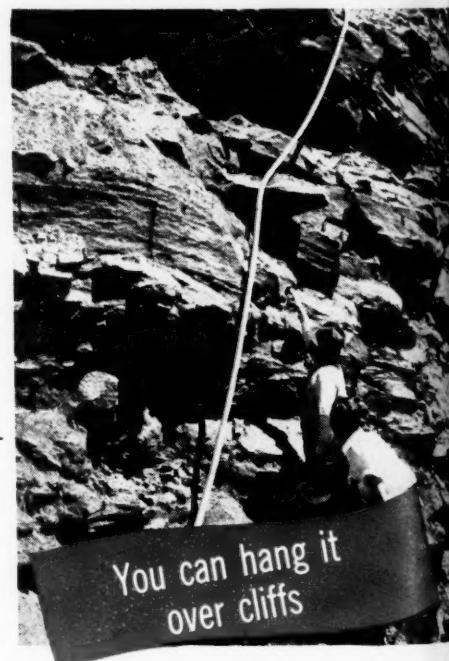
You can drive over it  
with heavy equipment

Its high resilience is the result of careful engineering . . . of tough, unbelievably strong components.



It resists flame

U-S-S Amerclad Cable is approved by the State of Pennsylvania under rigid new flame-resisting tests.



You can hang it  
over cliffs

When needed, steel supporting wires are built into U-S-S Amerclad so that it will more than support its own weight when suspended over cliffs or carried across streams.

## MINE SERVICE!

### *Construction Features*

Each conductor is a flexible, compound strand of tinned, annealed copper wires. Each strand is insulated with an extra-heavy wall of Amerite 30% performance-test rubber compound and is then covered with a rubber-filled tape. Over this is applied a Type PS—semi-conducting shielding tape. The three conductors are cabled together with three ground wires . . . one in each valley. Over this is applied a special tape to prevent adhesion of the ground wires to the surrounding rubber fillers and double neoprene jacket. This construction permits freedom of movement within the outer sheath and adds greatly to the flexibility of the entire cable.

*Write for Booklet*

Whatever the job, you can do it better with Amerclad Portable Power Cables. They're obtainable for low or high voltages, in every needed size and type. Write for our booklet, "Amerclad Cords and Cables". It will save you time and money.

#### AMERICAN STEEL & WIRE COMPANY

Cleveland, Chicago and New York

Columbia Steel Company, San Francisco, Pacific Coast Distributors  
Tennessee Coal, Iron & Railroad Company, Birmingham, Southern Distributors  
United States Steel Export Company, New York

UNITED STATES STEEL

**U·S·S AMERCLAD CABLE**

*Symbol of*  
**THE BEST IN**  
**TRUCK**  
*Service!*



To make profit from trucks—give them International Service. Here are 5 reasons why:

1. Mechanics who furnish International Service use International-Approved equipment for analysis and testing.
2. They install International factory-engineered parts.
3. They are trained in International shop methods.
4. They are kept constantly informed of all improvements in maintenance and service practices.
5. They are *truck* mechanics—specialists in truck service.

Yes, the International Triple-Diamond Emblem is the symbol of the best truck service—a best quickly available from thousands of International Dealers and from International Branches—the nation's largest company-owned truck-service organization.



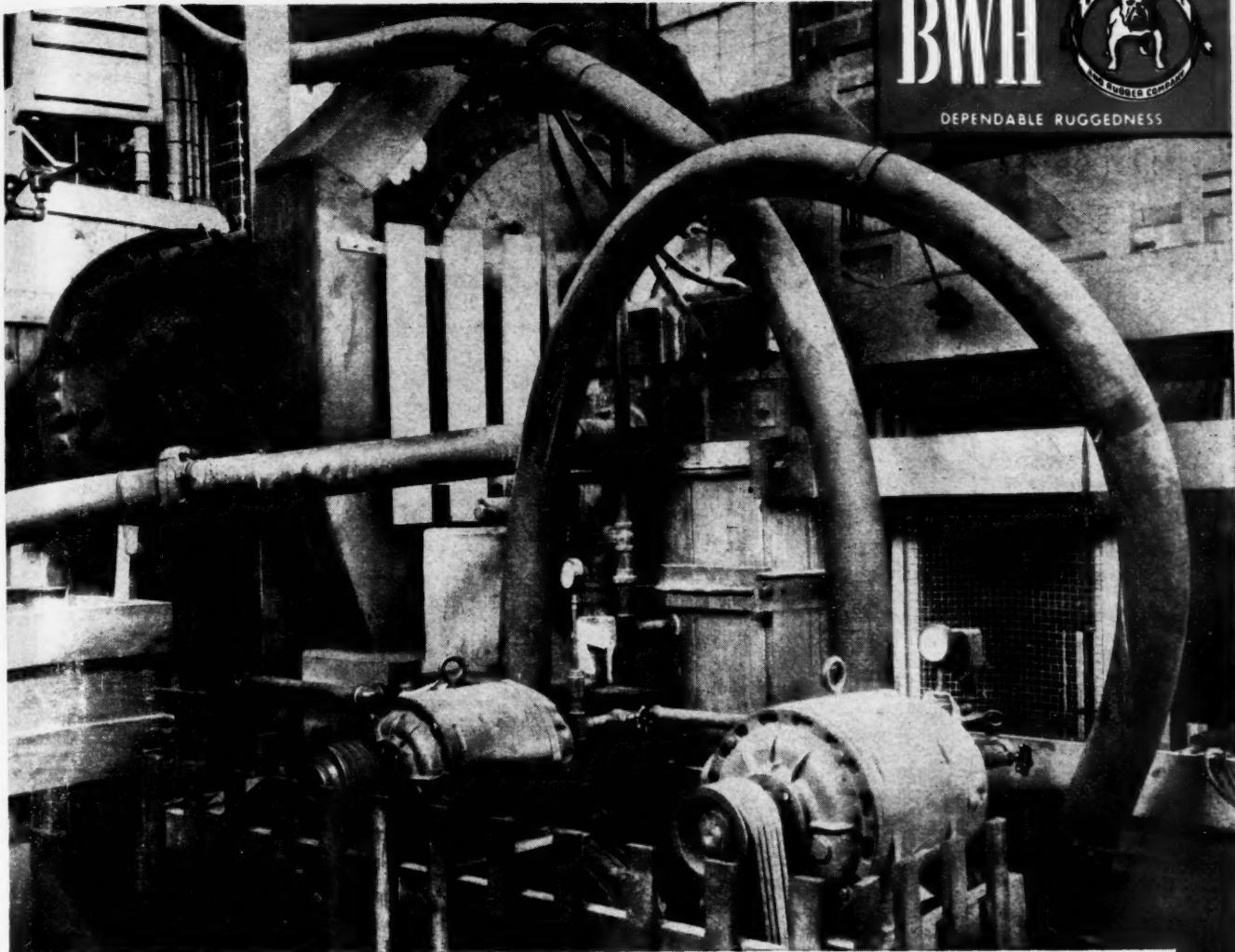
*Motor Truck Division*  
**INTERNATIONAL HARVESTER COMPANY**  
 180 North Michigan Avenue

Chicago 1, Illinois

Tune in James Melton  
 on "Harvest of Stars"  
 Every Sunday! NBC Network  
 See your newspaper for  
 time and station



**INTERNATIONAL Trucks**



ROUGH CUSTOMER HANDLED SMOOTHLY BY

## BWH ORE-HANDLING HOSE

To refine magnetite, it must be run through a series of hoppers that separate the ore from the waste sand. Carrying this heavy, highly abrasive ore to and from the hoppers requires hose that is highly flexible and has amazing durability. BWH solved the problem for a leading foundry with Bull Dog Ore Handling Hose.

This sturdy hose has multiple plies of heavy duck wound over a strong, one-inch-thick rubber lining. Beneath the two outer plies is a high tensile spiral wire imbedded in rubber. Spaced to give the hose maximum flexibility, the wire also adds strength and prevents

kinking. Finally, a high-grade, wear-resistant protective rubber cover encloses tube and fabric. Fittings are of the outside sleeve type; thus no metal comes in contact with the abrasive ore . . . and service of the hose is indefinitely prolonged.

When you require this or other types of industrial rubber goods, look to BWH for dependable ruggedness . . . BWH distributors for dependable service.

### HAVE YOU A JOB WHERE STAMINA COUNTS?

Bring us your toughest problems . . . we're specialists in solving them. Consult your nearby BWH distributor, or write direct to BWH.

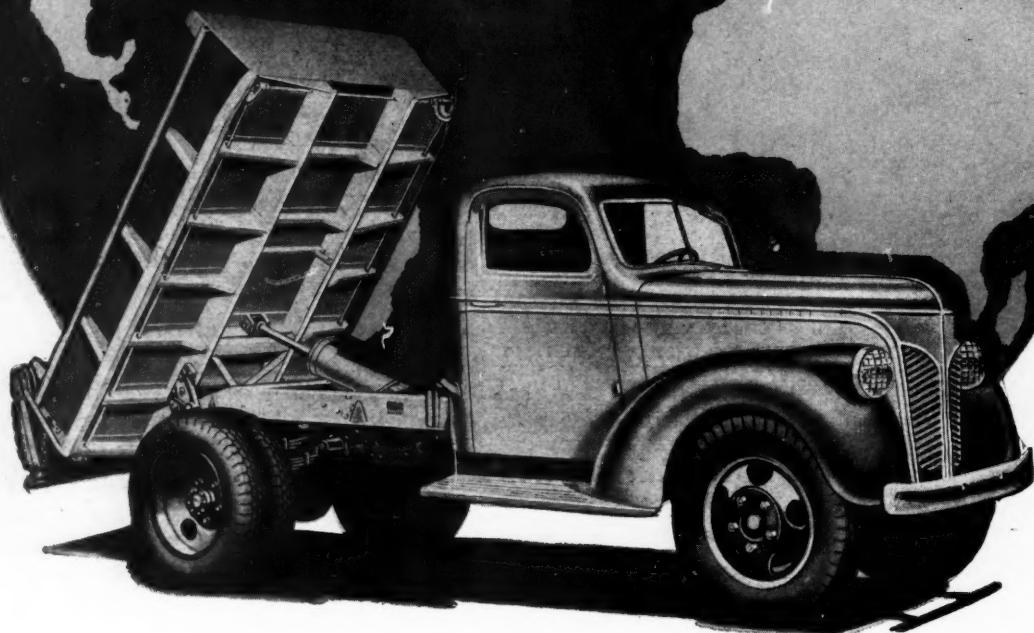
# BOSTON WOVEN HOSE & RUBBER COMPANY

Distributors in All Principal Cities

WORKS: CAMBRIDGE, MASS., U. S. A. • P. O. BOX 1071, BOSTON 3, MASS.

**IN USE EVERYWHERE**

*The world is your oyster!*

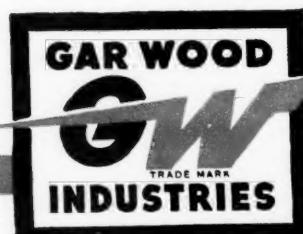


From one end of the world to the other, you'll find Gar Wood Hoists and Dump Bodies in action. The reason? They're designed, engineered, and built to do specific jobs, no matter how tough. Hydraulically operated, with simple controls...they dump cleanly, quickly, and easily...make it possible to get to the next job faster.

No matter what kind of material you work with... sand, gravel, rock, coal, or construction materials... there's a Gar Wood Hoist and Dump Body to make the job easier...help you make money, faster.

Gar Wood Hoists and Dump Bodies have been, and are constantly being proven all over the world on the toughest jobs. For your next job, specify Gar Wood.

**ROAD MACHINERY  
HEATING UNITS • MOTOR BOATS  
WINCHES AND CRANES**



# Another first . . .



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*Automatic*  
**DRAGLINE BUCKETS**

*New*  
and exclusive . . .



**PAGE REVERSIBLE  
CENTER SHANK  
TOOTH POINTS**  
*(secured by a hook bolt)*



**PAGE** ENGINEERING COMPANY  
CHICAGO 38, ILLINOIS

# Far-sighted coal mine executives are planning to meet rugged competition

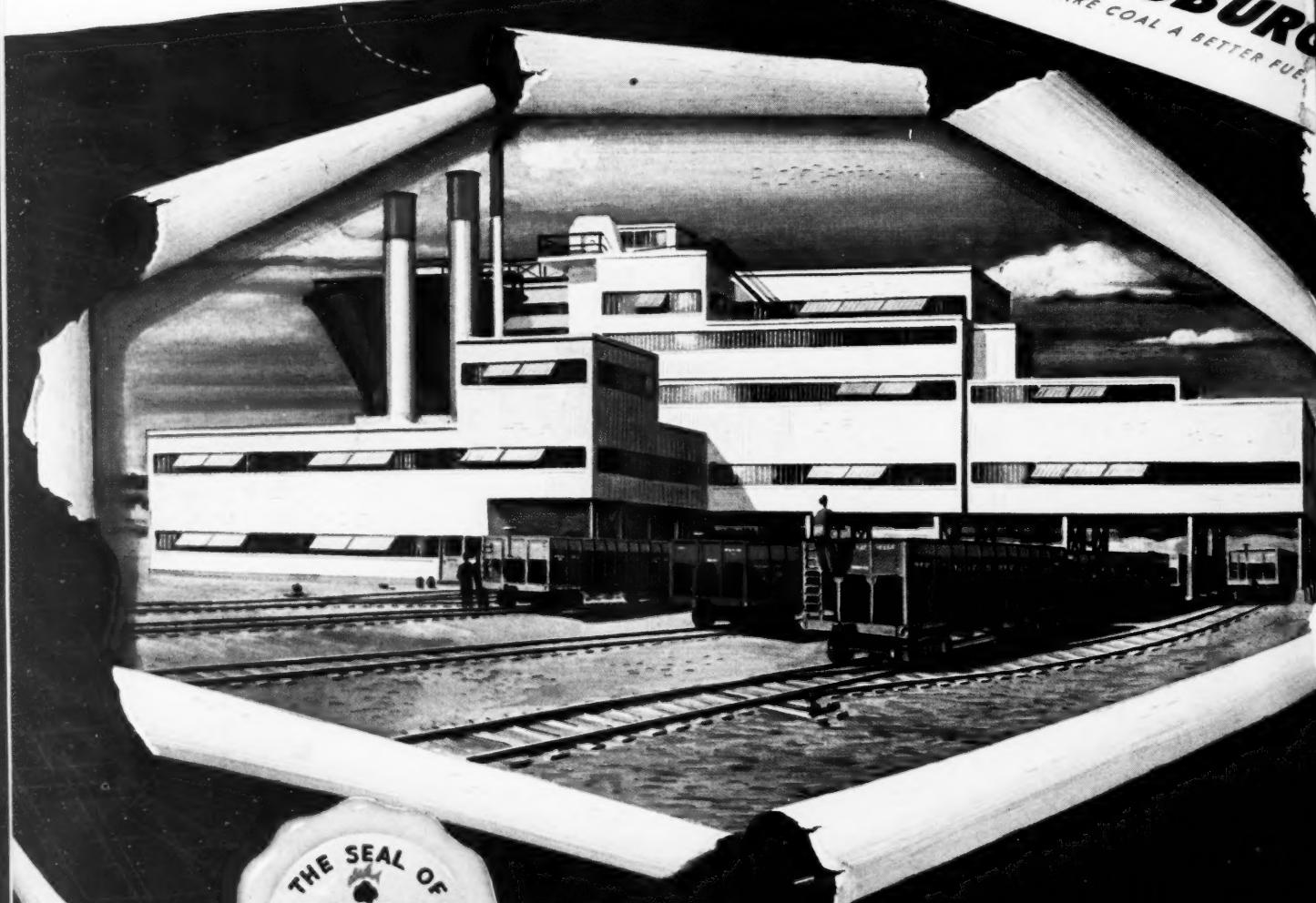
*During feverish wartime buying, coal was coal . . . anything that was black was offered as coal and very generally accepted by a war-emergency market.*

*Today far-sighted coal mine executives who study changing conditions see coal buyers again insisting on specification fuel, and they are planning to meet the demands by furnishing blends of low ash content that will continue to satisfy.*

*Even now over fifty million tons of coal are being prepared annually in modern plants built throughout the world by McNally Pittsburg.*

*Actual samples of your coal will be laboratory tested to determine what beneficiation can be accomplished and the type of preparation required to improve your position . . . to actually create your own market and stay in it at a profit.*

**McNALLY PITTSBURG**  
MANUFACTURERS OF EQUIPMENT TO MAKE COAL A BETTER FUEL



(Reproduction of advertisement substantially as it appears in Fortune Magazine.)

McNally Pittsburg Manufacturing Corporation, Pittsburg, Kans. • Morrow Manufacturing Company, subsidiary, Wellston, Ohio. Engineering & Sales Offices: Chicago 1, Ill. • Pittsburgh 22, Pa. • Columbus, Ohio • Wellston, Ohio • Caixa Postal 1310, Rio de Janeiro, Brazil.

# The Production Executive's dream comes to life in a new preparation plant!

You may have been dreaming for years of having a coal preparation plant in which you can meet any and all specifications. That need no longer be a dream... it is a present possibility, in fact, a necessity.

Let customers specify just what they want in size, ash, and moisture content, reaching to the peak of your new production capabilities... encourage your sales department to get in where your competition is most keen and hard to overcome.

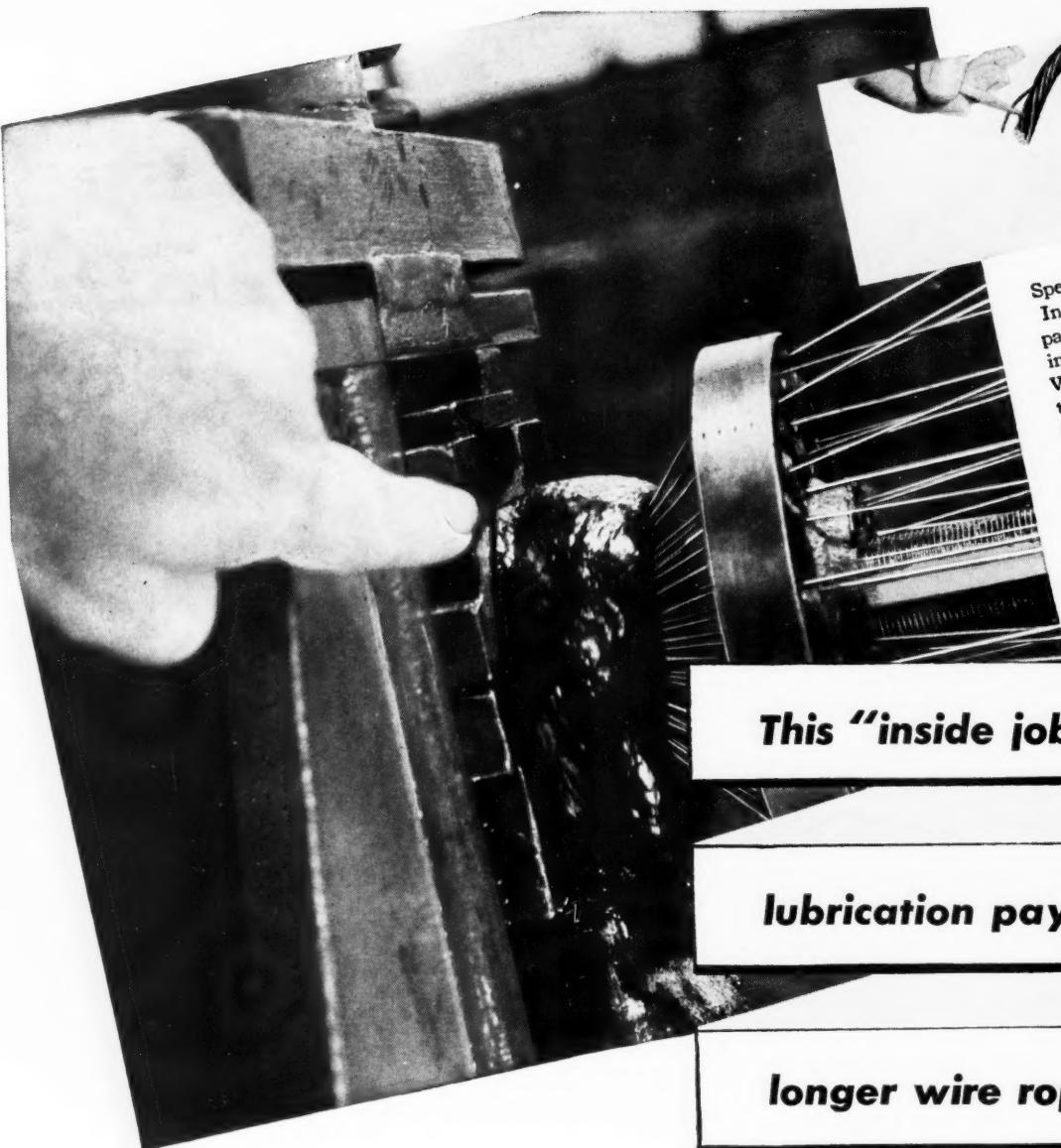
You can meet these requirements and come through with a product that will be consistently uniform every time and completely satisfactory to your customers.

Yes... when you see your plant going up you know that your production problems of manufacturing specification fuel at high tonnage levels per day will be solved. You will be rewarded for initiating the idea to make your own markets and then continue to produce the fuel that will keep you in.

**MCNALLY & PITTSBURG**  
MANUFACTURERS OF EQUIPMENT TO MAKE COAL A BETTER FUEL



McNally Pittsburg Manufacturing Corporation, Pittsburg, Kans. • Morrow Manufacturing Company, subsidiary, Wellston, Ohio. Engineering & Sales Offices: Chicago 1, Ill. • Pittsburgh 22, Pa. • Columbus, Ohio • Wellston, Ohio • Caixa Postal 1310, Rio de Janeiro, Brazil.



Special formula Macwhyte Internal Lubricant is packed around each wire in all strands of Macwhyte Wire Rope. This prolongs the rope's life by protecting the inside wires against rust and corrosion.

This "inside job" of

lubrication pays off in

longer wire rope service

Because it's thoroughly lubricated *on the inside*, Macwhyte Wire Rope lasts longer on your equipment. Our heavy, tenacious, special formula lubricant gives long-lasting protection. It is force-fed to wires as they are being closed into the strand. All wires, both inside and outside, are thoroughly encased in lubricant.

Macwhyte Internal Lubricant improves the sliding action of the wires as they move

in bending around sheaves and drums. It gives outside protection—but even more important, it protects the unseen inside wires which constitute the reserve strength and safety of the rope.

Extra life, assured by superior internal lubrication, quality materials and precision manufacture, makes Macwhyte Wire Rope your best buy.

'NO. 852



## MACWHYTE WIRE ROPE

Manufactured by Macwhyte Company  
2931 Fourteenth Avenue, Kenosha, Wisconsin

Mill Depots: New York • Pittsburgh • Chicago • Minneapolis • Fort Worth  
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Distributors throughout the U. S. A. and other countries



MACWHYTE PREformed and Non-PREformed Internally Lubricated Wire Ropes . . . MONARCH  
WHYTE STRAND Wire Rope . . . Special Traction Elevator Rope . . . ATLAS Braided  
Wire Rope SLINGS . . . Hi-Fatigue Aircraft Cables, Assemblies, Tie-Rods . . . Stainless Steel  
Wire Rope . . . Monel Metal Wire Rope, Galvanized Wire Rope.



Send for Macwhyte Wire  
Rope Catalog. Contains  
170 pages of valuable in-  
formation; lists Mac-  
whyte's complete line.  
Ask any Macwhyte rep-  
resentative or write  
Macwhyte Company.

Make MACWHYTE your headquarters for WIRE ROPE AND SLINGS

# CARDOX

"THE NON-EXPLOSIVE MINING METHOD"

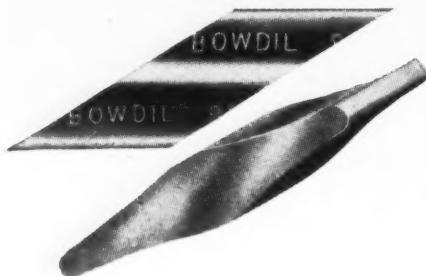
Wins Enthusiastic  
Dealer Approval  
by Reducing  
Shipping and  
Handling  
Degradation Losses

- Not the least of the problems of mine operation—especially if the coal is inherently soft and friable—are complaints from dealers due to degradation. Gentle handling can do little to decrease degradation, once the detonation of explosives has introduced shatter-cracks in the coal.

CARDOX limits degradation at the working face by breaking the face along its natural lines of cleavage—and with a slow, heaving action that does not weaken its structure. As a result, CARDOX-mined coal resists degradation during extensive mechanical handling and long shipments by train, boat or truck—does not crack up under rough handling in the dealer's yard.

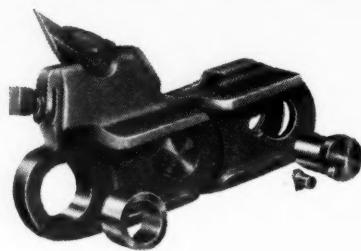
CARDOX CORPORATION • BELL BUILDING • CHICAGO 1, ILLINOIS

# BOWDIL



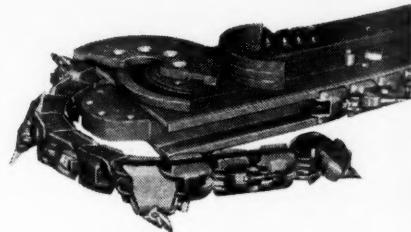
## CUTTER BITS

— Heat-treated and specially designed for coarse cutting, Bowdil bits save power—save time—save money. Bowdil bits have 25% more wearing length. Actual operating records in hundreds of mines prove they last 15% to 20% longer than others.



## FABRI-FORGED CHAIN

— is rugged—requires less maintenance than other types. Chain circles cutter bar at correct angle because of Bowdil's true-running, radial track guide. Drop-forged lug body stands up under heavy wear—is built for many times the normal load. Chain is easy to connect, remove or replace.



## CUTTER BARS

— High physical alloy steels and rivet-free design give Bowdil bars their great strength. Made for coarse cutting, they save power—provide long, trouble-free service. Fit all standard cutting machines.

## FIELD MEN AND REPRESENTATIVES in West Frankford, Illinois • Whitesburg,

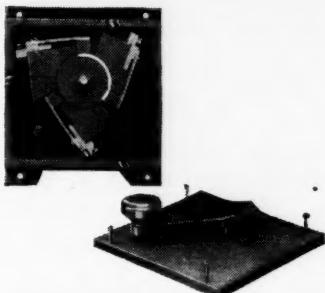
Kentucky • Charleroi, Pennsylvania • Denver, Colorado • Williamson, West Virginia

**Bowdil Equipment in your mine....**



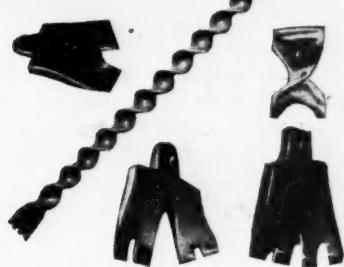
#### REPLACEABLE POINT PICKS

—make it possible for miners to carry "extra picks in their pockets." Designed for ideal weight and balance, workers would still choose this pick—even without the special replaceable, heat treated points.



#### CHOKE-ARC TRANSFER SWITCHES

—enable you to cut power immediately in case of a break down in the electric system. Bowdil switches are dependable—operate instantaneously. A vital safety factor!



#### AUGERS & DRILL BITS

—are furnished in many sizes and styles. All are heat-treated, tough, and long-wearing. Correct auger design eliminates "grabbing." Fish-tail, four-point, two-point, etc., styles assure you of the right bit for every job.

Big Stone Gap, Virginia • Canton, Ohio • Birmingham, Alabama • Centerville, Iowa  
Helper, Utah • Kansas City, Missouri • Topeka, Kansas • New Castle, England

**THE BOWDIL COMPANY**

**CANTON, OHIO**

*...brings profits out with the coal!*

# It's the **SIDES** of a V-Belt That Really Get the WEAR!

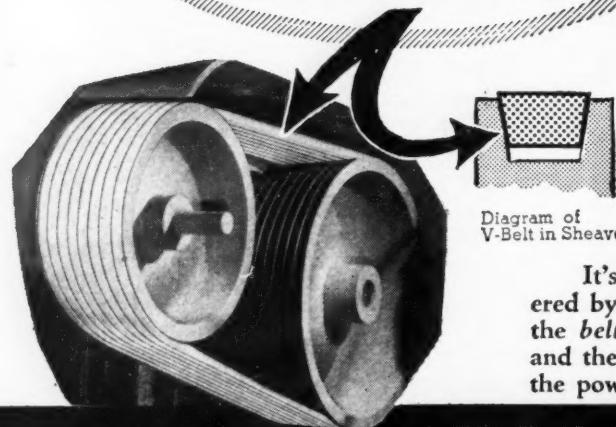


Diagram of  
V-Belt in Sheave

Look at this diagram of a V-Belt in its sheave. You see at once that the *sides* of the belt do all the gripping on the pulley and get all the wear against the sheave-groove wall.

It's the *sides*, moreover, that pick up all the power delivered by the driver pulley. The sides *transmit* that power to the *belt as a whole*. And then, once more, it's the sides—and the sides *alone*—that grip the driven pulley and *deliver* the power to it.

*It's Because  
the CONCAVE SIDE  
Reduces Sidewall Wear  
That It Is **IMPORTANT** to You!*



The fact that the *side* is the part that does the work and gets the wear explains why you have always noticed that the sidewall of the *ordinary* V-Belt is the part that wears out *first*. Naturally, then, when you lengthen the life of the sidewall you lengthen the life of the belt.

The simple diagrams on the right show exactly why the ordinary, *straight-sided* V-Belt gets excessive wear along the *middle of the sides*. They show also why the Patented Concave Side *greatly reduces* sidewall wear in Gates Vulco Ropes. That is the simple reason why your Gates Vulco Ropes are giving you so much longer service than any straight-sided V-Belts can possibly give.

## Longer Sidewall Wear Is **MORE IMPORTANT NOW** Than ever before!

Now that Gates Specialized Research has resulted in V-Belts having much stronger tension members—tension members of Rayon Cords and Flexible Steel Cables, among others—the sidewall of the belt is often called upon to transmit to the pulley much heavier loads. Naturally, with heavier loading on the sidewall the life-prolonging Concave Side is more important today than ever before!

### THE GATES RUBBER COMPANY

Denver, U.S.A.

World's Largest Makers of V-Belts

**GATES** **VULCO**  
ROPE **DRIVES**

Engineering Offices and Jobber Stocks IN ALL INDUSTRIAL CENTERS of the U. S. and 71 Foreign Countries

Straight Sided  
V-Belt

FIG. 1

How Straight Sided  
V-Belts Bulges  
When Bending Around  
Its Pulley

FIG. 1-A

You can actually feel the bulging of a straight-sided V-Belt by holding the sides between your finger and thumb and then bending the belt. Naturally, this bulging produces excessive wear along the middle of the sidewall as indicated by arrows.

Gates V-Belt with  
Patented Concave  
Sidewall

FIG. 2

Showing How Concave  
Side of Gates V-Belt  
Straightens to Make Per-  
fect Fit in Sheave Groove  
When Belt Is Bending  
Over Pulley

FIG. 2-A

No Bulging against the sides of the sheave groove means that sidewall wear is evenly distributed over the full width of the sidewall—and that means much longer life for the belt!

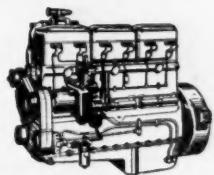


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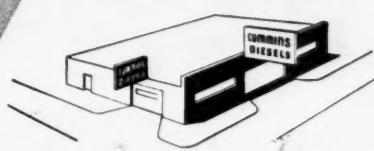
REG. U. S. PAT. OFF.  
THE MARK OF SPECIALIZED RESEARCH

# dependable

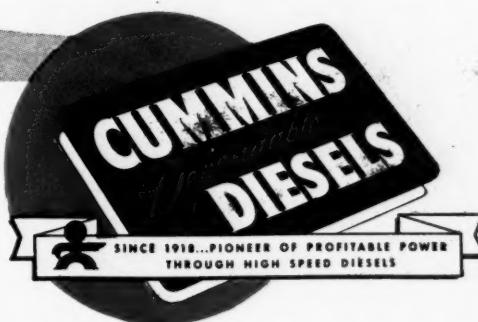
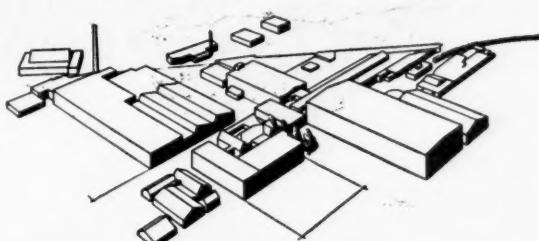
THE ENGINE



THE DEALER



THE MANUFACTURER



**a dependable engine** . . . proven dependable and economical on jobs such as yours.

**a dependable dealer** . . . near you . . . on call 24 hours a day with adequate parts and dependable mechanics.

**a dependable manufacturer** . . . who puts quality ahead of quantity . . . who recognizes that service comes ahead of sales.

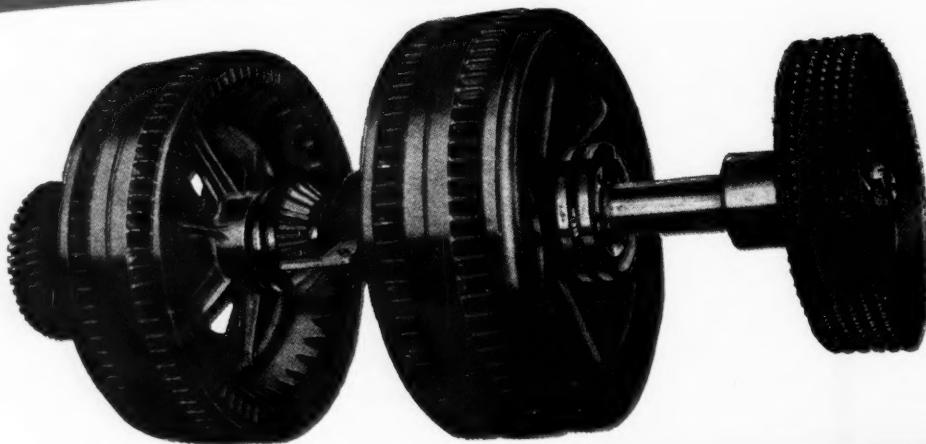
CUMMINS ENGINE COMPANY, INC., COLUMBUS, INDIANA

# WE ENDED SWING FRICTION TROUBLES by Removing the Cause

LOOK TO



You'll never again need lose a day—or even an hour—because of swing friction troubles. Not if you own a P&H Model 1055. *There are no swing clutches!* Instead, there's the P&H Magnetorque Swing Unit. There's no friction—no wear—no mechanical contact whatever between driving and driven members.



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## How the Magnetorque Swing Unit Operates

The P&H Magnetorque Unit uses electromagnetic forces to transmit power for swinging. The small amount of current needed is supplied by a little generator on the main engine. Control of current is from the

operator's station. Swinging actions—slow or fast—have cushioned acceleration and deceleration. It's smoother than anything you've ever seen. The Magnetorque also transmits the power for propel movements.

## ANOTHER P&H ADDED VALUE Speeds Operations — Increases Production — Cuts Costs

The P&H Magnetorque Swing Unit, now standard equipment on the P&H Model 1055, results in higher operating efficiencies and steadier digging.

Down time, usually needed for swing clutch maintenance, is converted to production time. It's like adding another work day—or more—each month.

The P&H Magnetorque Swing Unit will last the life of the machine. It's another P&H Added Value that pays for itself many times over.

Experienced construction and mining men who have seen the Magnetorque in action say it's one of the most important excavator improvements in the last 20 years. Ask for full information about it.

**P & H**

**EXCAVATORS**  
4540 W. National Ave.  
Milwaukee 14, Wis.

**HARNISCHFEGER**  
CORPORATION

EXCAVATORS • ELECTRIC CRANES • ARC WELDERS • P&H HOISTS • WELDING ELECTRODES • MOTORS

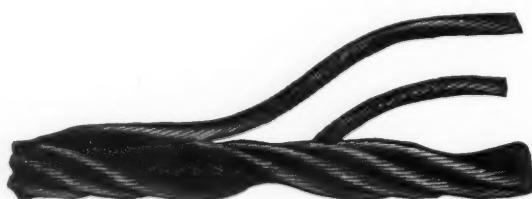
# Where does Form-Set Rope (PREFORMED) do a better job?

A good question—one we're often asked. Generally speaking, it does a better job wherever operating ropes pass around small sheaves and wind on small drums. Or where reverse bends are necessary. Or in other situations where added flexibility is a definite asset.

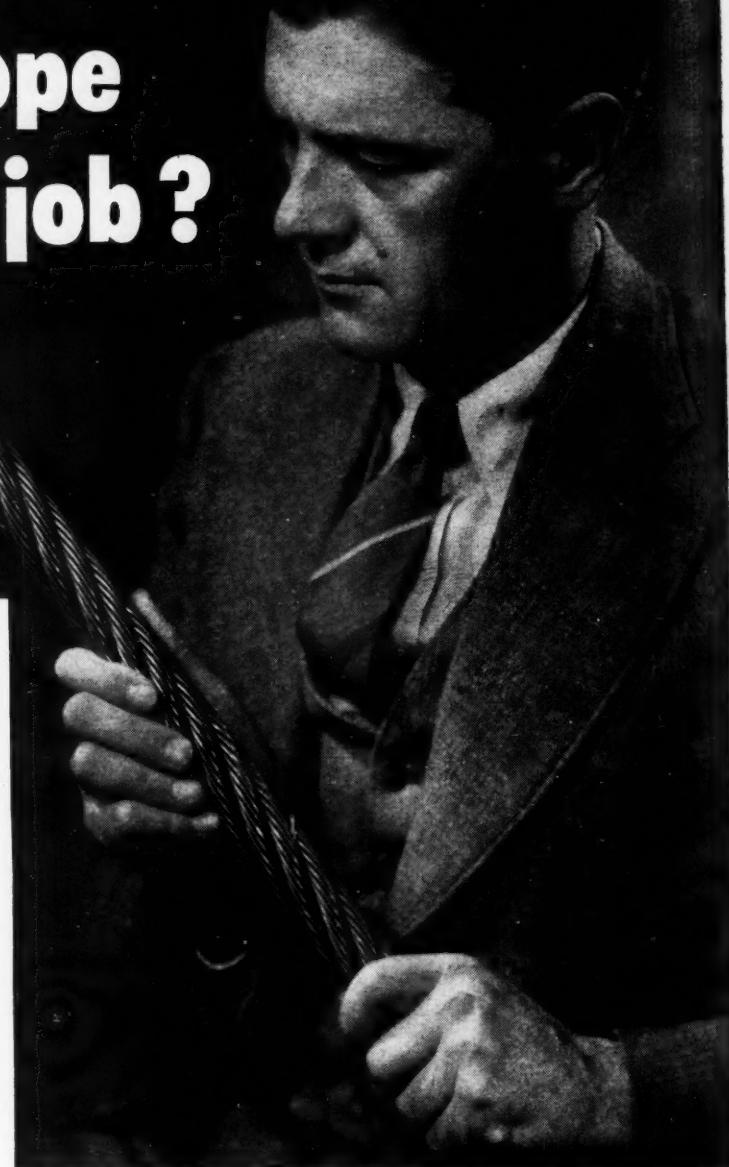
All grades, sizes, and types of Bethlehem wire rope can be furnished with the Form-Set (preformed) construction. We recommend preformed rope whenever extra performance thoroughly justifies its installation.

By extra performance we mean less kinking, better spooling, better reeving, and greater resistance to bending fatigue. The latter is especially important where running ropes must bend sharply, for preformed rope is free of pent-up internal stresses. It is "relaxed"; it does not fight itself to death.

Form-Set rope is as easily handled as a gentle, friendly dog. Yet it's tough, too—and it lasts.



Section of Form-Set (preformed) rope. The displaced strands shown here have been lifted out by hand; they cannot pop loose by themselves, even when cut or broken.



**BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.**  
On the Pacific Coast Bethlehem products are sold by  
Bethlehem Pacific Coast Steel Corporation

**When you think WIRE ROPE . . . think BETHLEHEM**



*Right Where  
you are...*



A.C.F. MINE CAR  
MANUFACTURING PLANTS



A.C.F. SALES OFFICES



COUNTIES PRODUCING  
1,000,000 OR MORE  
TONS OF COAL PER YEAR

**WE ARE TOO!** A.C.F. Mine Car manufacture is headed at Huntington, W. Va....in the heart of the bituminous region...with another plant at Berwick, Pa.—middle of the anthracite belt. Strategic location means not only an intimate knowledge of the coal producing area, but faster deliveries and lower shipping costs to you!

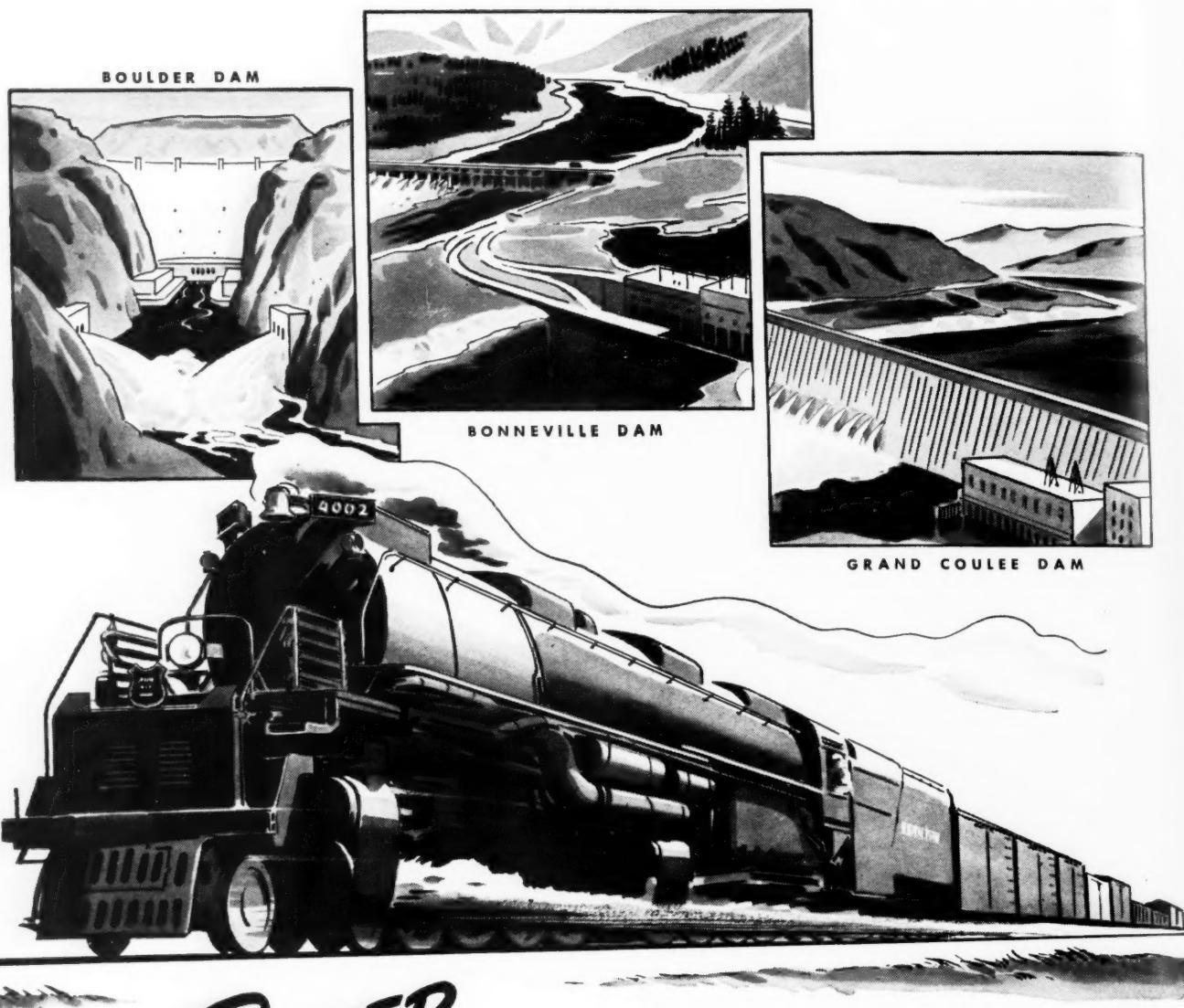
Sales and service representatives, too, are immediately accessible, so they may be acquainted with your local problems of mine transportation. Contact our Sales Representative today; he is close by ready to serve you.



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**A.C.F. MINE CARS**

## A MESSAGE TO THE COAL INDUSTRY



*More POWER  
to you*

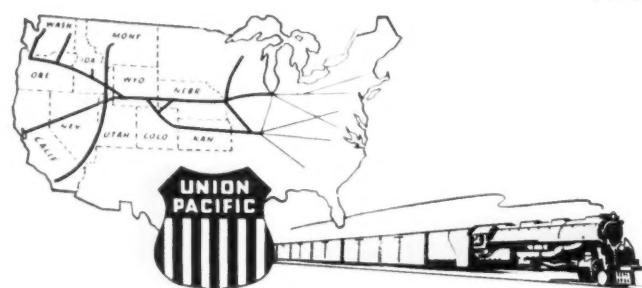
Three great dams, harnessing the natural force of the Colorado and Columbia Rivers, provide tremendous industrial power.

Giants of the rails, the Union Pacific "Big Boy" locomotives provide freight transportation power over the Strategic Middle Route.

Power, light, and efficient transportation . . . combined with a wealth of raw materials and adequate "growing space" . . . offer unusual opportunities for industry in the Union Pacific West.

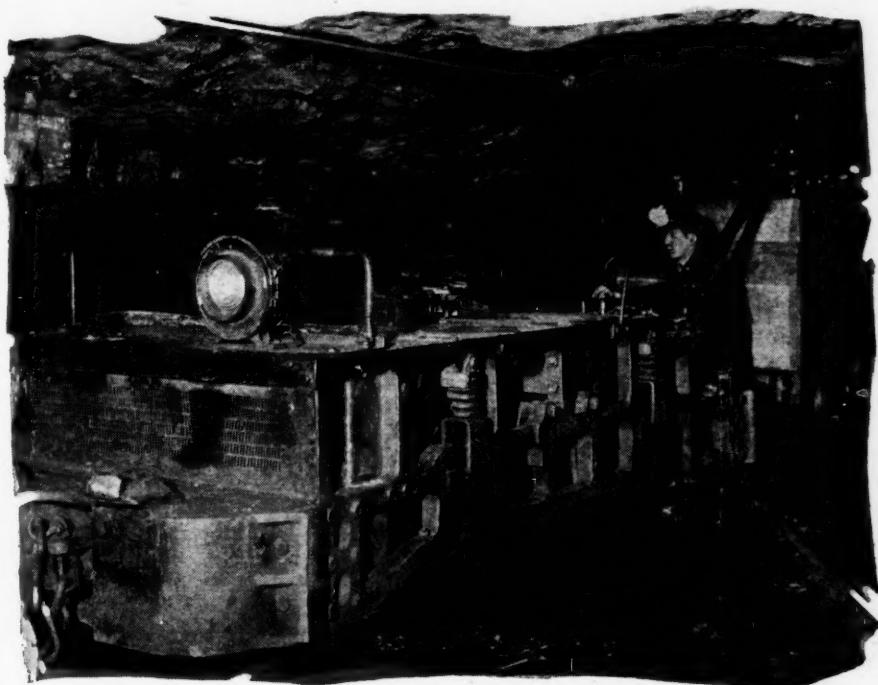
**be Specific -  
say "Union Pacific"**

★ *Union Pacific will gladly furnish confidential information regarding available industrial sites having trackage facilities in the territory it serves. Address Industrial Dept., Union Pacific Railroad, Omaha 2, Nebraska.*



**UNION PACIFIC RAILROAD**  
*The Strategic Middle Route*

**"Trouble-free operation...  
under all weather conditions..."**



**WITH Tycol #19 grease THE MODERN MINE CAR LUBRICANT**

- Low temperature drag eliminated . . .**
- Power requirements lowered . . .**
- Minimum wear of bearings . . .**
- Leakage reduced . . .**
- Repair bills slashed . . .**

Yes . . . more and more mining engineers are discovering that Tycol #19 Grease provides peak performance no matter what the atmospheric conditions . . . for this new lubricant is scientifically compounded to assure maximum results down to 0° F. — and lower.

For full details concerning the benefits of Tycol #19 Grease, contact your nearest Tide Water Associated office today.

**LUBRICATION—"ENGINEERED TO FIT THE JOB"**

COAL AGE • December, 1946



Boston • Charlotte, N. C.  
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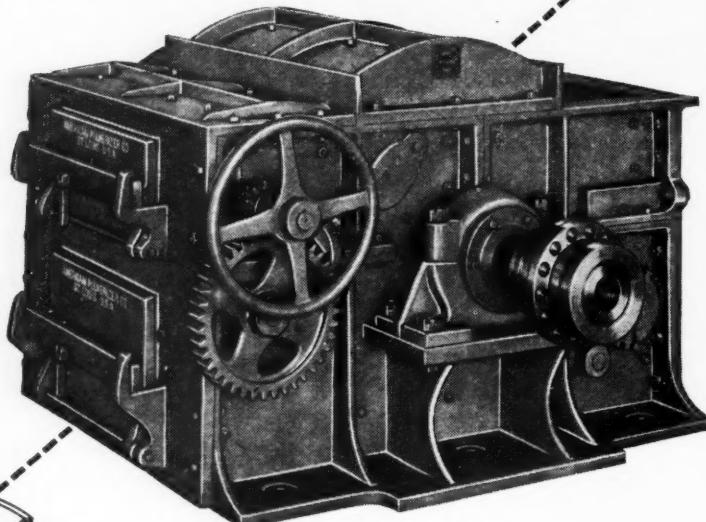
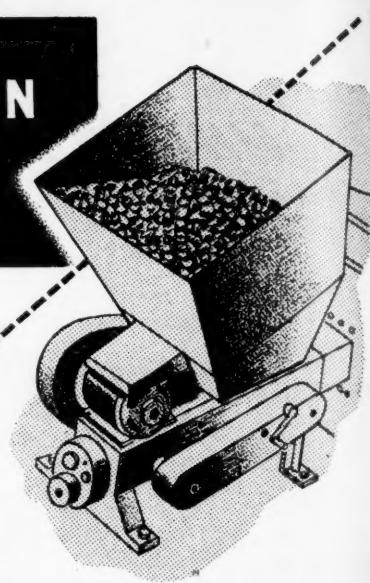


# AMERICAN Rolling Ring CRUSHERS

**GEAR IN YOUR COAL PREPARATION  
WITH TODAY'S FIRING DEMANDS**

**High tonnage reduction of ROM to stoker or pulverizer size with controlled fines and no oversize**

The high capacity of American AC Type Crushers (from 50 to 500 TPH), assures efficient, high tonnage coal preparation with low-cost operation.



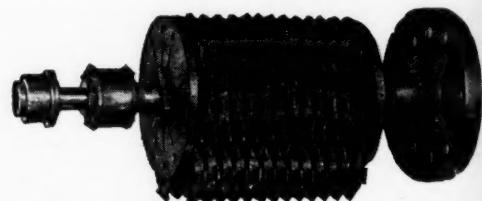
The patented manganese steel shredder rings of the American AC Type Crusher reduces by rapid splitting impact rather than crushes for a uniform product. The shredder rings with the 20 cutting edges swing free on their own shafts. Shredder rings deflect upon contact with tramp metal, protecting the crusher from possible injury.

Photo of rotor at right shows shredder rings with their multiple cutting edges giving rapid impact at slow, power-saving speeds.

As changing markets demand stoker or pulverizer sizes, the flexibility of Americans answer this demand with their double adjustability to size runs and wide range reduction. Americans are equally adaptable to one-step and to circuit operations.

For full, profitable operating flexibility, install an American Crusher that will rapidly and efficiently crush ROM or screenings to uniform stoker or pulverizer size . . . resulting in minimum fines and no oversize. Americans are of massive construction, yet compact for minimum headroom requirements. Accessible adjustments simplifies size control. Breaker plate, grinder plate, shredder rings, and grate bars, are of manganese steel.

Americans prove a dependable, efficient crushing unit, capable of constant, high tonnage production at low, overall operating cost of less than 1¢ per ton.



*Write for the latest bulletin on low-cost, efficient coal crushing.*

**American** PULVERIZER COMPANY  
Originators and Manufacturers of  
Ring Crushers and Pulverizers

1119 Macklind Avenue  
St. Louis 10, Mo.

# TOURNAPULLS lick steep grades to STRIP WEST VIRGINIA COAL



**Problem:** On the R & R Coal Company property at Lost Creek, West Virginia, a 300,000-yard hill of sandy clay and soapstone had to be stripped . . . hauls involved grades as steep as 20% to waste overburden on the valley floor 400' below.

**Solution:** To meet these difficult job conditions of steep grades and tough materials, Paul Ross, one of the first in this area to use Tournapulls for coal stripping, put 2 of these high-speed rubber-tired Scraper units to work.

**Results:** Typical production showed each Tournapull averaged 11 loads of clay an hour on 1500' cycle, in spite of grades to 20%. The last 7 to 8' layer of soapstone above coal was rooted for easy loading. In addition to moving 65% of total yardage, R & R's Tournapulls maintained their own haul road.

Like these progressive operators, you'll find Tournapulls' low-cost answers your stripping problems where haul or rehandling is involved . . . let your LeTourneau Distributor show you WHY.

Tournapull — Trade Mark Reg. U. S. Pat. Off. CM9



**LETOURNEAU**  
PEORIA, ILLINOIS



# TOURNAPULLS

Mine equipment  
delivers efficient performance  
at minimum operating cost

when the Gulf Lubrication Engineer  
is "in the picture"—

GULF Lubrication Engineers are specialists in scientific coal mine lubrication. That's why they are "in the picture" in scores of leading mines, cooperating closely with production and maintenance men to attain better all-round efficiency.

By recommending the proper oils and greases for every moving part, and the best methods of



The Gulf Lubrication Engineer in the picture (left) is checking conveyor lubrication in a prominent West Virginia mine.

application, Gulf Lubrication Engineers help to reduce wear, improve safety, increase tonnage, and cut maintenance and power costs.

Make sure you are getting the advantages of all recent developments in petroleum science. Write, wire, or phone your nearest Gulf office today and ask a Gulf Lubrication Engineer to call.

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*So what about this tire?*

**IT'S ROUGH!**

This FIRESTONE GROUND GRIP TIRE has carried tens of thousands of cubic yards of dirt over the rockiest haul roads to be found in the western Mountain States. No down time has ever been charged against this tire.

**IT'S TOUGH!**

Those massive tread bars have absorbed the most grueling punishment a tire can be asked to take, have protected the body from blows and cuts. Double thick sidewalls have resisted snagging, cutting and rutwear.

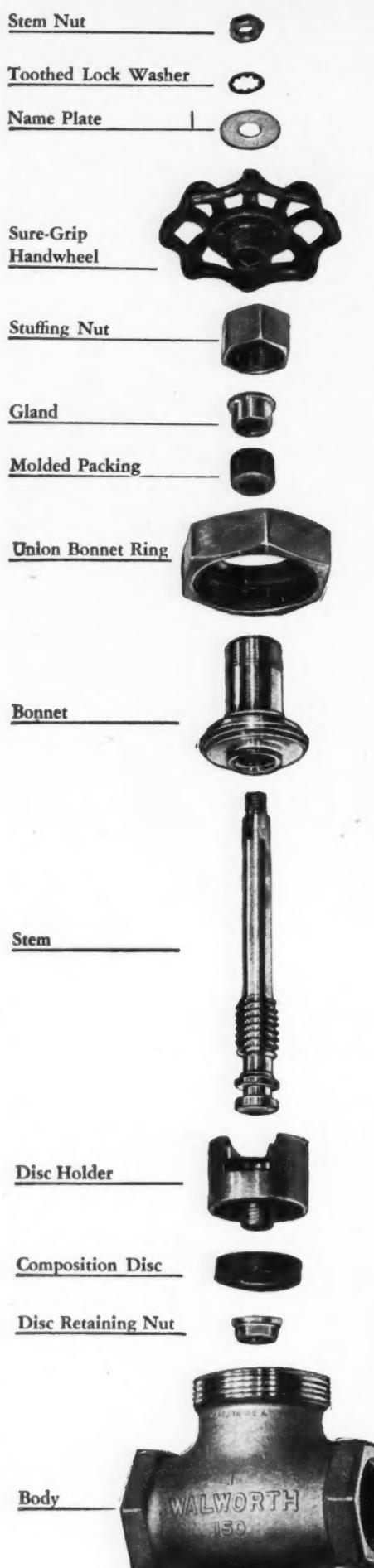
**IT'S READY FOR MORE!**

This FIRESTONE GROUND GRIP, having already delivered many more hours of service than normally expected on this type of operation, is ready to roll—will carry many more thousands of tons of payload.



GROUND GRIP   ROCK GRIP   EARTH MOVER

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**TO MAKE  
A GOOD VALVE  
BETTER**



**Walworth has redesigned  
and improved its No. 95  
Quality Bronze Globe Valve.**

**150 pounds working steam pressure at 500°F**

**300 pounds cold water, oil, or gas.**

**Can be repacked under pressure when fully opened.**

The Walworth No. 95 Bronze Valve has always been tops with piping men because they liked these features: Renewable composition disc; lock-on, slip-off disc holder; union bonnet construction; deep stuffing box; tough bronze body made of Composition M (ASTM B61).

Now Walworth has added these improvements: (1) New cylindrical disc holder that accurately guides the disc to the seat, regardless of the position in which you install the valve. (2) Newly designed, air-cooled, sure-grip handwheel that you can grab and turn, even when wearing greasy work gloves. It has a tapered square hole sized to goe to fit snugly on the finished square of the stem. (3) Toothed lock-washer to prevent the stem nut from becoming loose. (4) All parts have been redesigned to give maximum service and strength.

Walworth Quality Bronze Valves are available in Globe (No. 95), Angle (No. 96), or Check (No. 97) types and in sizes from  $\frac{1}{4}$  to 3 inches (check valves  $\frac{1}{4}$  to 2 inches). Ask your Walworth distributor to show you the improved Walworth No. 95 Bronze Valve, or write for further details.

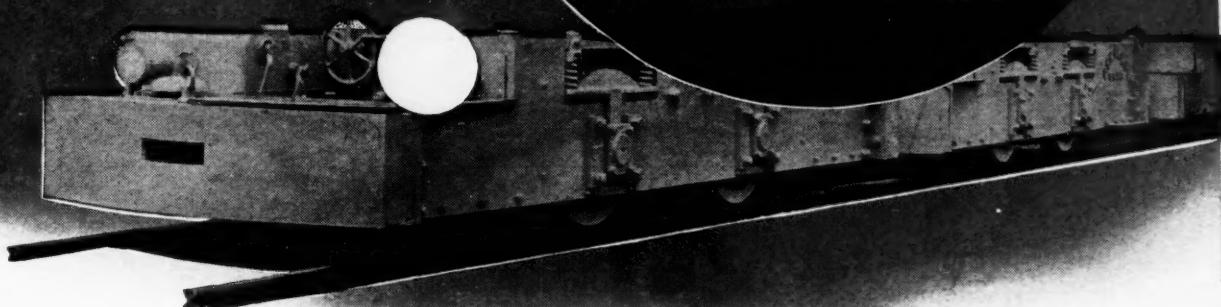
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**valves and fittings**  
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**DISTRIBUTORS IN PRINCIPAL  
CENTERS THROUGHOUT THE WORLD**

In your  
modernization  
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***Don't overlook***

***this spot!***



## **Westinghouse Hydraulic Brakes**

Here's a chance to make a simple modernization move pay double dividends in improved haulage.

Westinghouse Hydraulic Brakes help your locomotives to move more tonnage because average trip speeds can be increased. Trips can go faster . . . because they can stop faster.

Westinghouse Hydraulic Brakes help your locomotives to move more tonnage because they spend less time in the shop. Elimination of motor-bucking means fewer split pinions, broken axles and armature caps, less damage to coils and insulation, a reduction in burned contact tips and fingers.

In tandem service, Westinghouse Hydraulic Brakes provide the double-braking needed to match the double power, utilize the combined weight of the units in slowing and stopping.

Westinghouse Hydraulic Brakes are compact and easily installed. You can put them on next time the locomotive is in the shop. No interference with existing brake rigging. We would like to quote on your requirements. May we have the information indicated in panel at right?

### **INFORMATION FOR QUOTATION**

1. Make, model or class of locomotive.
2. Weight.
3. Type of service.
4. Sketch showing overall dimensions.
5. Track gage.
6. Sketch showing arrangement of brake rigging and dimensions of levers.
7. Current supply to oil pump motor: (a) trolley or battery? (b) Nominal, minimum or maximum voltage.
8. Hydraulic sanding required?
9. Single or tandem operation?
10. If tandem (a) permanent or intermittent? (b) one or two control stations? (c) all equipment on one locomotive? (d) 4 point or 2 point sanding?



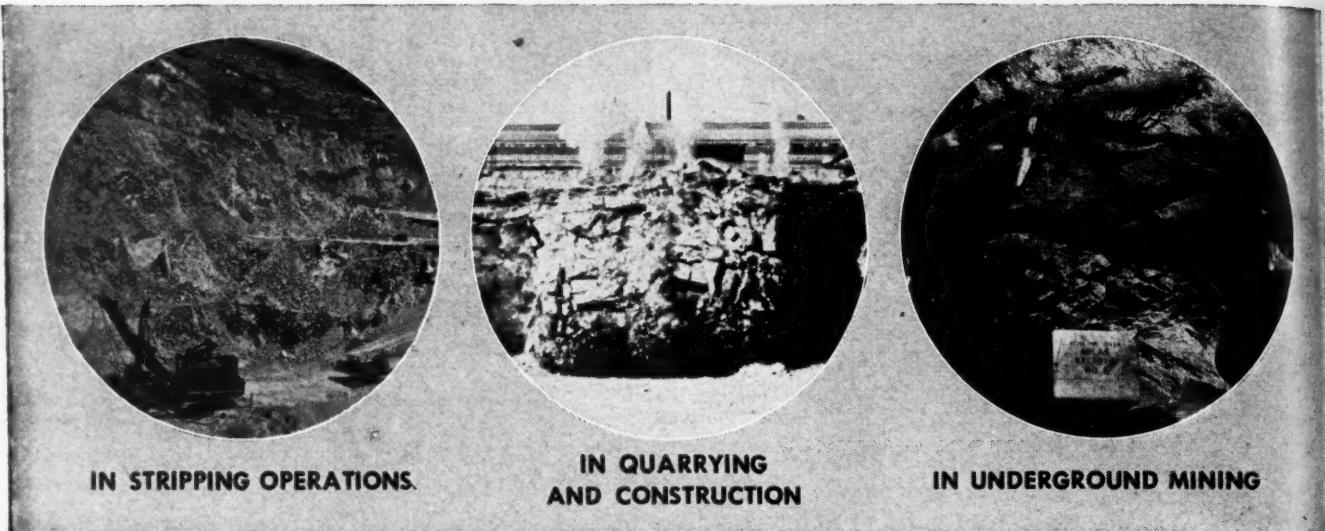
**WESTINGHOUSE AIR BRAKE COMPANY**

INDUSTRIAL DIVISION

WILMINGTON, PA.

# BLASTING SENSATION OF 1946

## ATLAS ROCKMASTER BLASTING SYSTEM



IN STRIPPING OPERATIONS.

IN QUARRYING  
AND CONSTRUCTION

IN UNDERGROUND MINING

Genuine Atlas Rockmaster... the first major blasting development since the war . . . is the sensation of the year. The now famous *one-two* blasting punch is paying off!

By enabling the blaster to time his delay in milliseconds . . . a feat never before possible . . . Atlas Rockmaster has boosted production tremendously. All records for fragmentation have been broken. Shovel efficiency has increased. And, believe it or not, complaints about noise and vibration have ceased in many cases, even when more holes are shot with each blast.

Rockmaster is *not* just a new blasting device. *It's a whole system* "made to measure" for each particular job. It takes into account drilling, type of explosive, and timing of detonation. No wonder blasters and shovel operators all over the country are praising Atlas Rockmaster. Call in your Atlas representative and find out how Rockmaster can be tailored to fit your own problems.

"ROCKMASTER"—Trade Mark  
Manasite: Reg. U. S. Pat. Off.

LESS BARK...  
MORE BITE

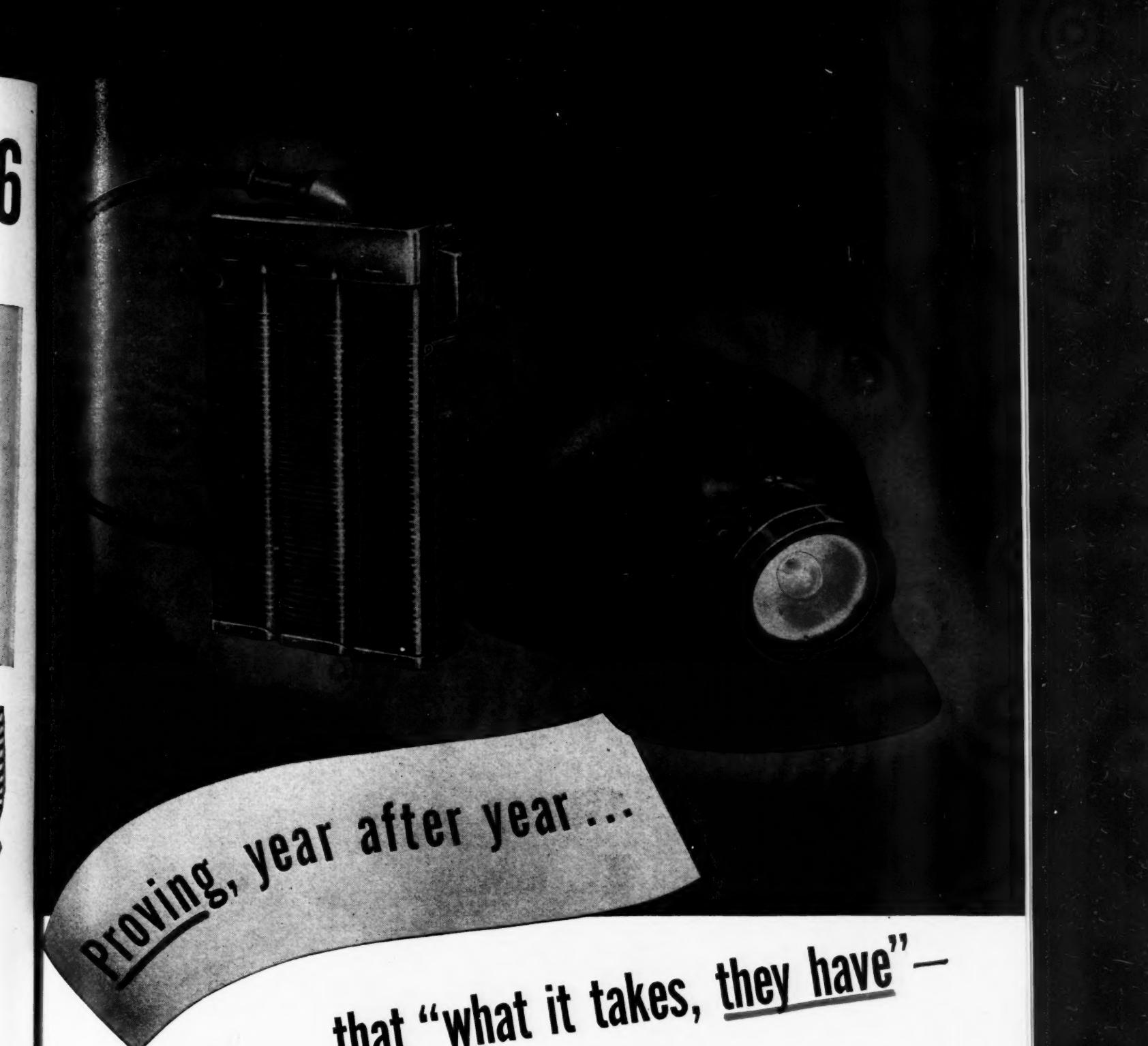


You get the extra safety of  
Manasite Detonators, too



**ATLAS** EXPLOSIVES  
"Everything for Blasting"

ATLAS POWDER COMPANY, Wilmington 99, Del. • Offices in principal cities • Cable Address—Atpowco



*Proving, year after year ...*

*that "what it takes, they have" —*

Edison Electric Cap Lamps are armored to resist hard use—unique in construction to deliver years on end of dependable service. They are *mining quality* through and through.

Paired with M. S. A. Comfo Caps, high-pressure molded of laminated bakelite—tough, strong, durable—Edison Lamps offer the maximum in personal protection for the more than 600,000 men who wear them! Ask for a demonstration!

**EDISON ELECTRIC  
CAP LAMPS**

**M·S·A** **COMFO CAPS**



**MINE SAFETY APPLIANCES COMPANY**  
BRADDOCK, THOMAS AND MEADE STREETS . . . PITTSBURGH 8, PA.

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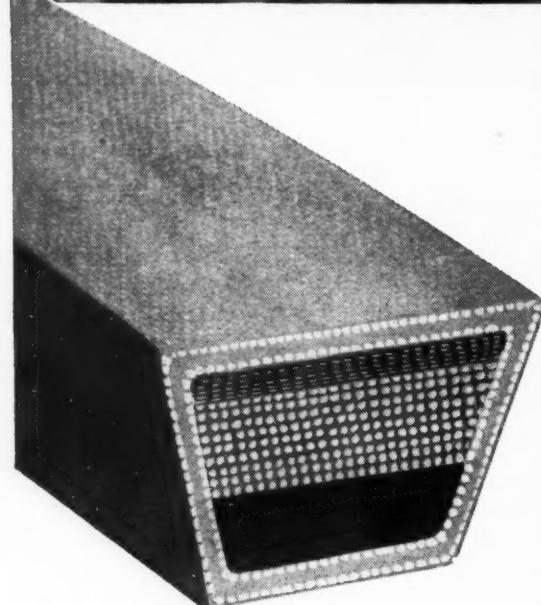
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Montreal . . . Calgary . . . Winnipeg . . . Vancouver . . . New Glasgow, N. S.

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**PUTTING  
ON THE**

# Pressure



**Heat-Resisting Super-7**  
Stands temperatures up to 180°. The TEXROPE V-Belt for most drives.



**Oil-Resisting Super-7**  
Neoprene cover protects core against moderately oily or greasy conditions.



**Oil-Proof Super-7**  
Made of Neoprene throughout. Use it when the belt must swim in oil.



**Static-Resisting Super-7**  
Recommended where explosion hazard exists. Static-conducting element throughout cover won't wear off.



to give you  
tougher, truer-running  
**TEXROPE**  
**V-BELTS**

**PRECISION** curing in these powerful pressure molds gives TEXROPE Super-7 V-Belts their toughness and accuracy of section.

The molds themselves are machined to precision tolerances. Heat, pressure and curing time are accurately controlled. Skilled operators check every step of the process.

This careful curing combines strong, hard-twisted cords, rugged two-ply cover stock and shock-absorbing rubber into BETTER V-BELTS to drive your machines — uniform, long-lasting, smooth-running.

## ONE CALL—FOR ALL V-BELT DRIVE NEEDS

Your nearest Allis-Chalmers office or dealer offers COMPLETE V-Belt Drive service: Super-7 V-Belts in all types and sizes — full range of standard, "Magic-Grip" and Vari-Pitch sheaves — Speed changers — experienced engineering aid by the originators of industry's Multiple V-Belt Drive. **ALLIS-CHALMERS, MILWAUKEE 1, WISCONSIN.**

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**ALLIS**  **CHALMERS**

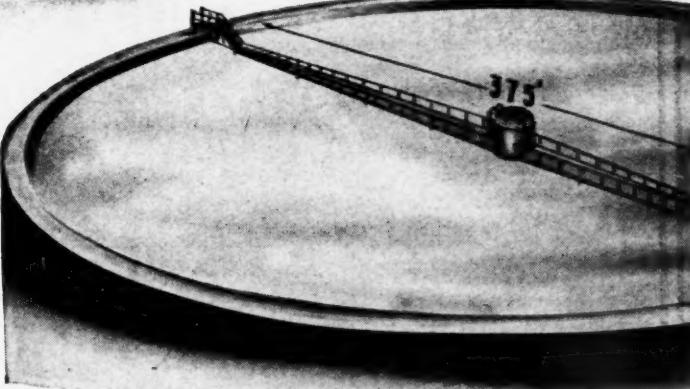
One of the Big 3 in Electric Power Equipment —  
Biggest of All in Range of Industrial Products

**TEXROPE**  
**V-BELT DRIVES**

The TWO  
**LARGEST THICKENERS**  
IN THE WORLD  
have just been ordered from  
**GENERAL AMERICAN**

375'

OTHER  
GENERAL AMERICAN  
PRODUCTS  
FILTERS  
DEWATERERS  
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STEEL STACKS  
STORAGE TANKS



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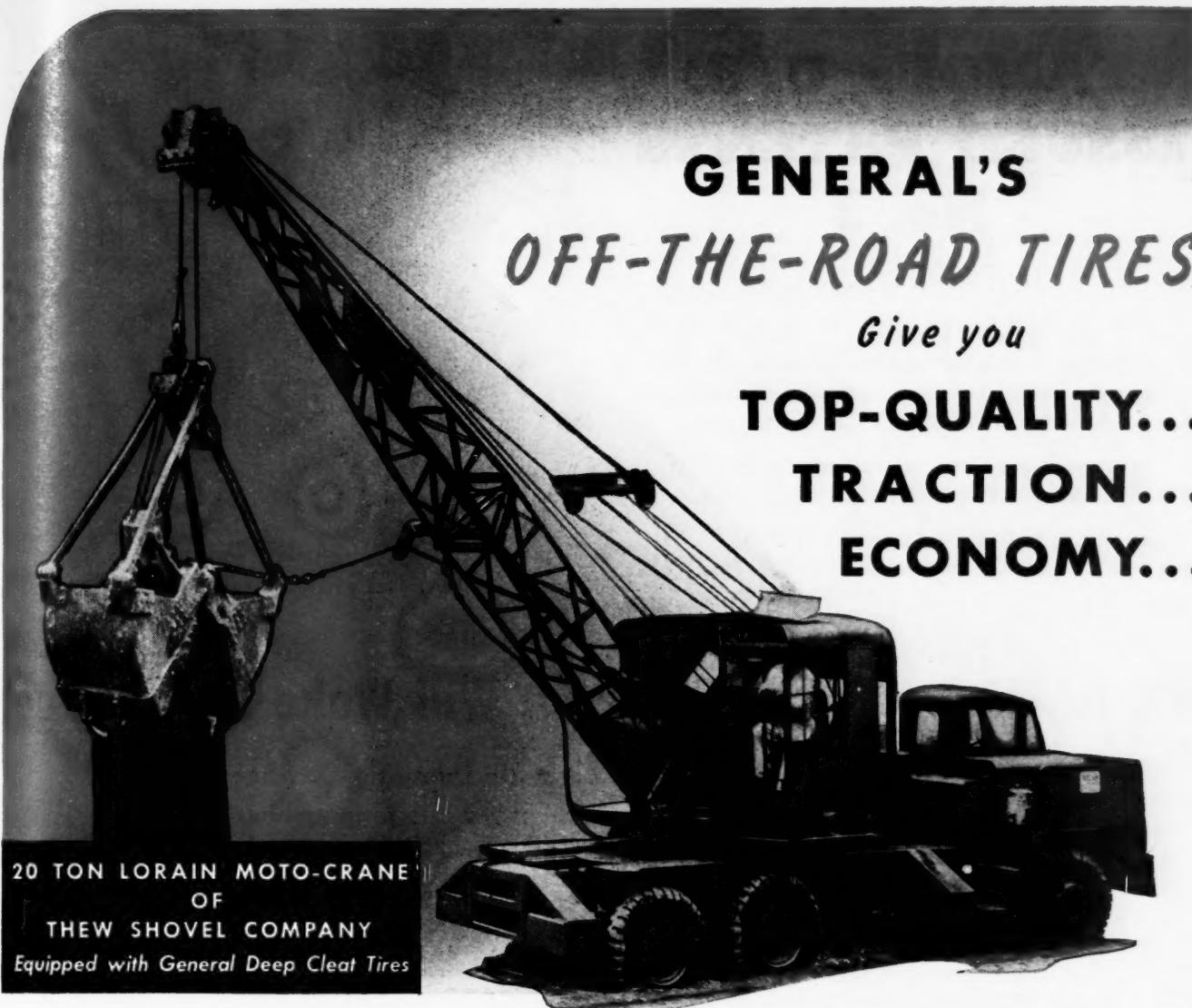
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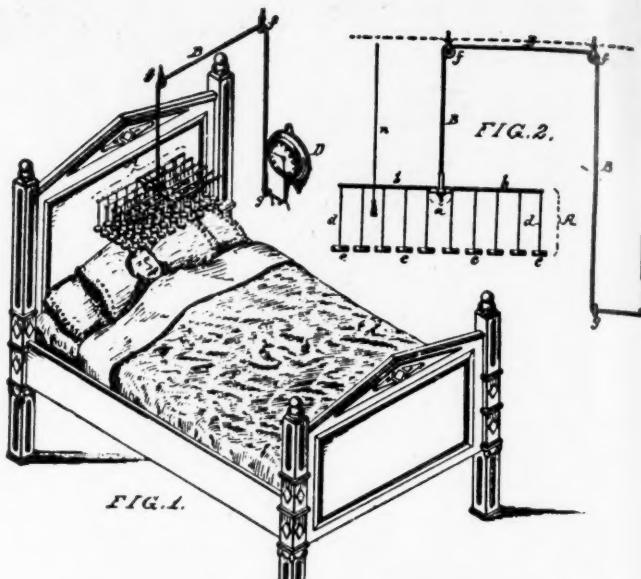


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(Language quoted taken directly from U. S. patent.)



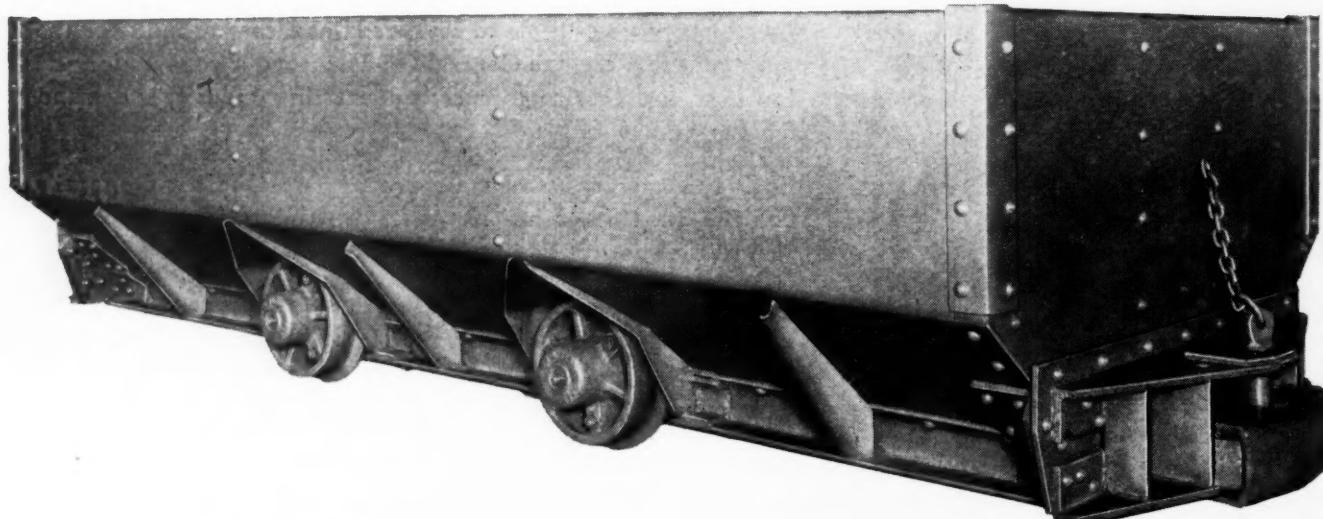
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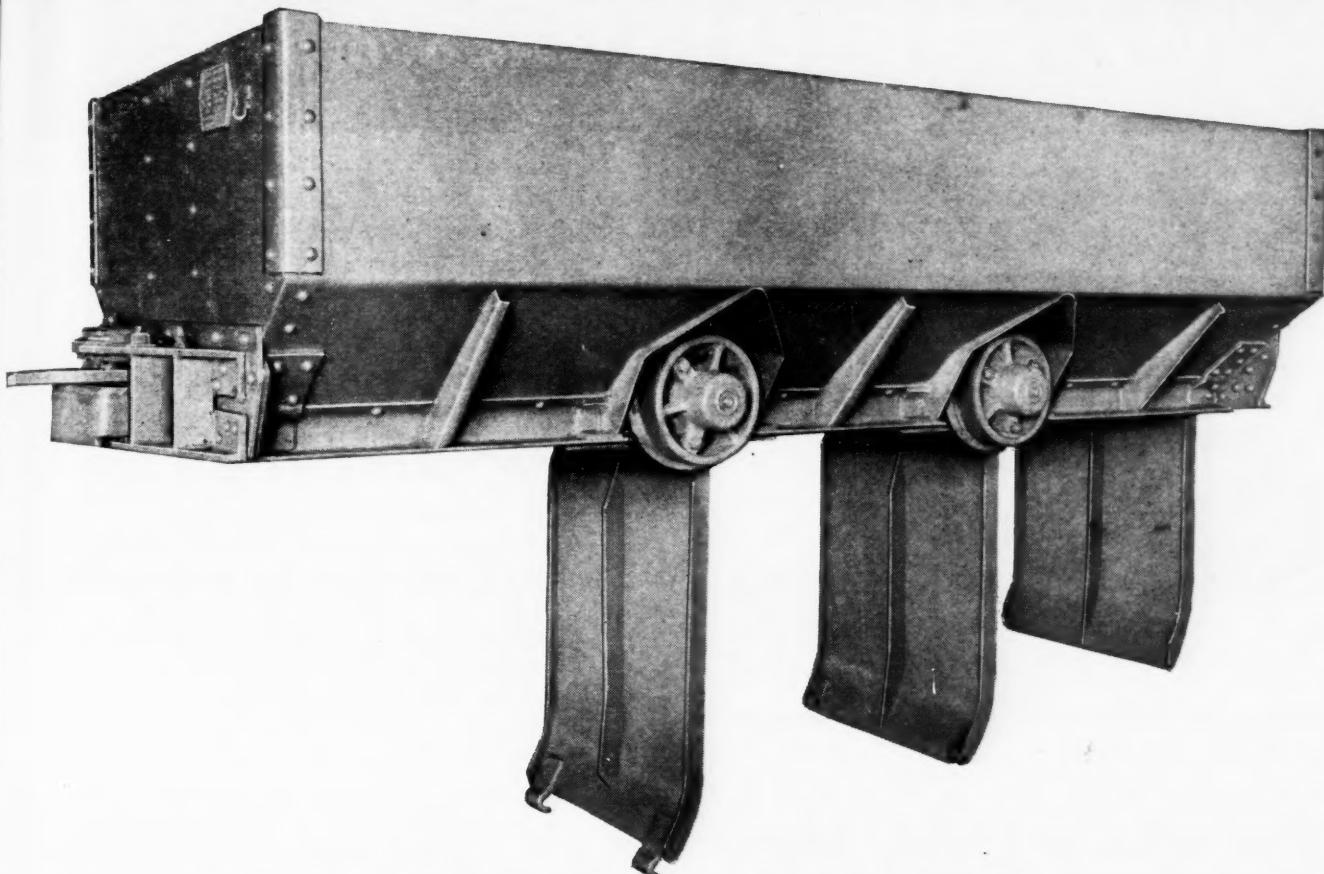


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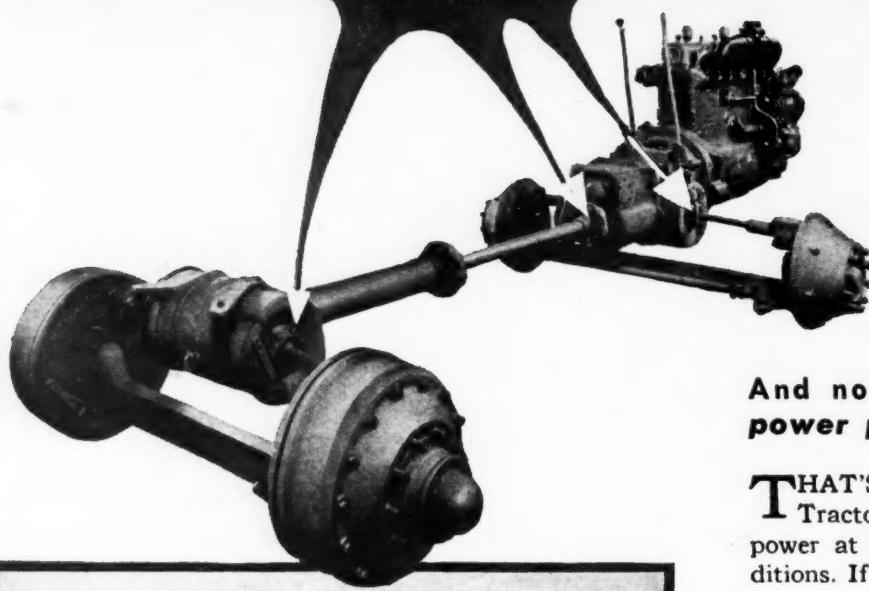
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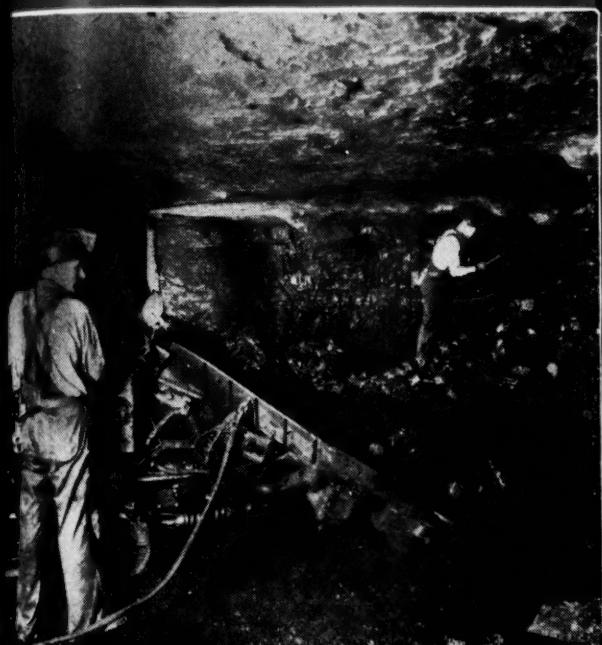
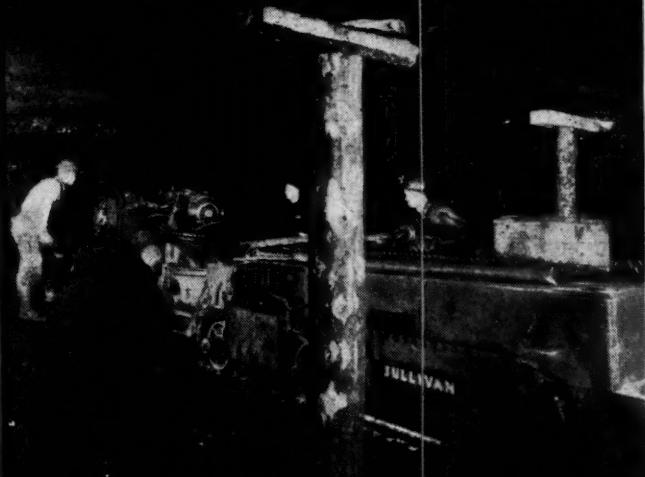
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DECEMBER, 1946

# COAL AND THE COAL MINER

MARK Dec. 7, 1946 as the date the coal industry entered a new labor-relations era. For the first time, it has emerged from a labor crisis free of public criticism. For the first time, the miner is not bitter toward his employer. At the end of no previous labor crisis has the attitude of government, the public and the miner so favored the operator.

But the gains are not all in the past. The mounting flood of public resentment, greatly heightened by the recent stoppage, assures legislative machinery strengthening the operator's position in future labor disputes. The operator, long accustomed to all manner of criticism from his employees, the union, the public and, frequently, the government, suddenly finds himself completely absolved and surrounded by allies it seemed were always on the opposing side. There might seem to be cause for satisfaction—even for gloating. Few operators, however, will waste time indulging in either. They will rather seize the opportunity to enhance soundly their position with both employees and the public.

Whatever the forthcoming legislation, it can be assumed that no laws can be passed automatically assuring freedom from either union or public pressure. Workers will continue to strive for better pay and working conditions. Labor unions can be expected to take every possible step to hold members by getting them

more benefits within the framework of the new laws. To look for anything else would be naive and unrealistic. The new laws, whatever they are, will bring no changes in the fundamentals of achieving sound labor relations. They probably will bring considerable changes in labor-relations techniques, particularly on the part of unions. The autocratic union techniques of the past, it may be expected, will be technologically obsolete. Statesmanship on both sides will gradually emerge. To believe anything else would be to believe America can learn nothing from the past.

This is all to the good. Let no one assume, however, that any law or temporary union setback will condone or legalize poor labor relations. The same human emotions—the same pressures—will remain.

We can assume that an unhappy cycle has ended—that a new era is in the making. What the new era will bring will depend in part on continued public awareness and in part on the wisdom of the law makers. As for the coal operator, he should assume that it will depend largely on his own actions. The new period can mean that good labor and public relations will have the best chance to pay off in coal-industry history.

Let us not gloat. Let us seize the great opportunity of the hour to bring about the labor peace so devoutly desired by the operators, the miners and the public.

# The Union and Coal

THROUGHOUT the growth of the United Mine Workers prior to World War I, its disintegration in the 20's and early 30's and its rapid resurgence after 1933, coal operators have sought a favorable basis for relations with their employees, although they have often disagreed with the miners, outside interests and the public on what that basis should be.

As early as 1886, wage-cutting and industry demoralization were named as reasons for a joint call for negotiations by union officials and a substan-

tial group of operators, which led to formation of the old Central Competitive Field (Indiana, Illinois, Ohio and Western Pennsylvania) in 1896.

From that nucleus, mine-worker organization spread to other fields, not, however, without some violence and bloodshed and some outspoken operator opposition, which the courts on occasion backed up. By and large, though, the union gained because even doubtful operators welcomed the idea of stability in the area of greatest cost—wages—and because union lead-

ership tempered militance in accordance with circumstances.

In 1919, when the postwar boom was running its brief course, came Lewis. The U.M.W. embraced more than 400,000 miners. Leading operators accepted it. But 1919 also brought a work stoppage involving a controversy over whether the bituminous contract had been abrogated before actual expiration. The strike brought government intervention and reinstatement of government price and distribution controls. In that year also,

## UNITED MINE WORKERS—1919-1946

### PHASE I—BUBBLE BOOM

	INDUSTRY STATISTICS		UNION ACTION		RESULTS
	BIT.	ANTH.			
1919	Number mines....	8,994	....	Lewis becomes head of U.M.W. with 434,987 total and 391,339 dues-paying members; basic day scale \$5.70 against \$3.60 in 1917.	Government controls reinstated; President Wilson intervenes.
	Number men....	621,998	154,571	U.M.W. convention votes for 60% pay increase, 30-hour five-day week and nationalization.	Strike called off for preliminary 14% increase and appointment of a federal commission after federal court moved against union and Lewis ended strike.
	Avg. hrly. wage....	\$0.759	\$0.641	Strike Nov. 1 to Dec. 12, involving at peak 415,000 men and 71% of capacity.	Commission award of \$6 day wage upped to \$7.50 in 1920 after strike action.
	Tons per man-day...	3.84	2.14		
	Avg. value per ton.	\$2.49	\$4.14		
1922	Number mines....	9,299	....	Major strikes in bituminous and anthracite; biggest bituminous stoppage to that date, lasting 117 days and involving 460,589 men and 73% of capacity at peak. Operators asked wage reduction in line with economic conditions; union asked increase.	Peak wage rates of 1920 retained in bituminous.
	Number men....	687,958	156,849	Anthracite strike ran 138 days, involving 142,442 men; demands followed bituminous pattern.	Previous anthracite terms gained in 1920 continued to 1923.
	Tons per man-day...	4.28	2.31		Non-union mining activity increasing sharply, putting heavier strain on union properties in period when postwar boom was beginning to collapse, liquidation was beginning and efficiency in use was taking heavier toll.
	Av. value per ton.	\$3.02	\$5.01		
1924	Number mines....	7,586	....	Convention votes for contract on best possible terms; later interpreted as no wage reduction despite growing depression in industry and pressure for adjustments to meet non-union competition.	Jacksonville agreement, effective to 1927, signed in February; continued \$7.50 wage scale; not accepted by all operators, and strikes called to force them into line. Closing of union operations accelerated.
	Number men....	619,604	160,009		Beginning of break-up of union in bituminous field.
	Avg. hrly. wage....	\$0.813	\$0.857		No action in anthracite; pay rise of 10% granted in 1923.
	Tons per man-day...	4.56	2.00		
	Avg. value per ton.	\$2.20	\$6.08		

## PHASE II—BUST

	INDUSTRY STATISTICS		UNION ACTION	RESULTS	
	BIT.	ANTH.			
1925	Number mines.... Number men.... Avg. hrly. wage.... Tons per man-day... Avg. value per ton.	7,144 588,493 \$0.800 4.52 \$2.04	160,312 \$0.852 2.12 \$5.94	Anthracite strike called to gain increase in wages and checkoff. Strike lasted 140 days and involved 145,000 men.	Anthracite strike settled by five-year contract with no substantial changes. In bituminous, Jacksonville agreement abrogated by a number of operators after request for modification was rejected. Anthracite lost heavily and permanently to competition. Jacksonville scale rendered largely formal; union break-up accelerated.
1927	Number mines.... Number men.... Avg. hrly. wage.... Tons per man-day... Avg. value per ton.	7,011 593,918 \$0.751 4.45 \$1.99	165,259 \$0.843 2.15 \$5.89	Wage boost and other concessions asked in bituminous industry. Widespread strikes occur.	Jacksonville agreement terminated but succeeded by interim agreements in some fields into 1928.
1928	Number mines.... Number men.... Avg. hrly. wage.... Tons per man-day... Avg. value per ton.	6,450 522,150 \$0.716 4.73 \$1.86	160,681 \$0.838 2.17 \$5.70	Strike action still taken to try to hold operators in line but largely ineffective.	Districts released by union to make agreements on best terms available; wage reductions generally accepted. End of Central Competitive Field and any substantial union influence in the bituminous industry.

## PHASE III—MONOPOLY

1933	Number mines.... Number men.... Avg. hrly. wage.... Tons per man-day... Avg. value per ton.	5,555 418,703 \$0.501 4.78 \$1.34	104,633 \$0.818 2.60 \$4.46	NIRA passed; industry practically 100% organized in whirlwind campaign; little operator opposition because majority felt union would promote stability.	Appalachian agreement signed, setting up this area as the new guide for all other fields; base scales for 8-hour day set at \$4.60 North and \$4.20 South; management rights upheld; supervisors excluded.
1935	Number mines.... Number men.... Avg. hrly. wage.... Tons per man-day... Avg. value per ton.	6,315 462,403 \$0.745 4.50 \$1.77	103,269 \$0.823 2.68 \$4.29	Five work stoppages called to back up demands; Roosevelt intervenes.	Wage rates upped to \$5.50 and \$5.10 from \$5 and \$4.60 for 7-hour day granted in 1934. Lewis forms C.I.O., from which he resigns in 1940 after coming out for Willkie.
1936	Number mines.... Number men.... Avg. hrly. wage.... Tons per man-day... Avg. value per ton.	6,875 477,204 \$0.794 4.62 \$1.76	102,081 \$0.833 2.79 \$4.42		Anthracite contract includes checkoff, statement of union responsibility and 7-hour day, 35-hour week.
1939	Number mines.... Number men.... Avg. hrly. wage.... Tons per man-day... Avg. value per ton	5,820 421,788 \$0.886 5.25 \$1.84	93,600 \$0.923 3.02 \$3.85	Six-week strike called for wage increases, "recognition clause," limitation of "foremen," double time on Sundays and holidays and union-made tools and supplies; 6-hour day, 30-hour week and guaranteed year asked in 1937.	After intervention by Roosevelt, who had seizure under consideration, strike settled by granting "union shop"; no increase in rates of \$6 and \$5.60 with time and one-half granted in 1937.

	INDUSTRY STATISTICS		UNION ACTION	RESULTS
	BIT.	ANTH.		
1941	Number mines.... 6,822 Number men.... 456,981 Avg. hrly. wage.... \$0.993 Tons per man-day.. 5.20 Avg. value per ton. \$2.19	.... 88,054 \$0.971 3.04 \$4.59	Four-week stoppage in bituminous to gain 1939 demands, wage boost and elimination of Southern differential. One-day stoppage in anthracite. Captive mines struck for union shop Sept. 15, walkout eventually involving over 200,000 men; wildcat walkout in commercial mines to support captive strike later declared legal.	National defense program goes into high gear; Pearl Harbor, Dec. 7. Southern differential eliminated at request of Roosevelt; base scale boosted to \$7 all around. Campaign split Appalachian conference. New anthracite agreement granted 10% increase. Arbitration board suggested by Roosevelt awards "union shop" in captive mines.
1943	Number mines.... 6,620 Number men.... 416,007 Avg. hrly. wage.... \$1.139 Tons per man-day.. 5.38 Avg. value per ton. \$2.69	.... 79,153 \$1.069 2.78 \$5.38	Strikes June 1-7, June 15-30 and Nov. 1-8 in bituminous. Despite stabilization measures, union announced no settlement for less than a \$2 a day increase, other concessions and portal-to-portal pay, although union in 1940 had joined in requesting government to approve the principle of counting time as time at the face.	Anthracite and bituminous mines seized May 1 and Nov. 1; agreement signed by Ickes Nov. 3 granting portal-to-portal pay and other concessions; operators negotiated agreement Dec. 17. The year 1943 marked increasing refusal to bargain except on union terms. Foremen's organization started in 1943; resulted in seizure of a number of mines Aug. 31.
1945	Number mines.... .... Number men.... 72,842 Avg. hrly. wage.... \$1.239 Tons per man-day.. 5.78 Avg. value per ton. \$3.06	.... \$1.236 2.79 \$6.26	Two bituminous strikes for 11 days and four weeks; first for wage increase, increased portal pay, shift differential, foremen's unionization and health-and-welfare fund; second, wildcat variety, to force foremen's issue, involved over 210,000 men; finally called off by Lewis until more propitious time.	Fringe increases and shift differentials granted in bituminous settlement. Anthracite mines seized May 1, returned June 22; miners refused to go back after seizure; settlement granted fringe increases, increased vacation pay, 7-hour day and 35-hour basic work week; Lewis joined with operators in urging increase productivity.
1946			Bituminous mines closed for six weeks from April 1 in support of demands for higher wages, royalty, foremen's unionization, safety provisions, etc. Anthracite mines closed one week for same demands. Second bituminous walkout takes place Nov. 20 after abrogation of contract with government; ended by Lewis Dec. 7.	Bituminous mines seized May 22; Krug-Lewis agreement May 29 grants \$1.85 daily increase, most other demands; similar anthracite contract signed June 7. Seizure and government control prove ineffective in preventing work stoppages. The 1946 negotiations mark new phase in bargaining approach: with the operators, settlement of one point at a time and refusal to discuss anything else; with the government, apparently one of asking agreement in advance.

on Nov. 11, Lewis bowed to a federal court. An award by a government-sponsored commission was further boosted by strike action in 1922.

In 1922, the handwriting on the wall was becoming clearer. Non-union competition was increasing and rising

efficiency in coal use was cutting into consumption. A boom growing out of artificially stimulated demand was running into the need for liquidating increased producing capacity, encouraged by the government to meet wartime needs and further enlarged by the

lure of quick profits in an inflated market.

In the face of all this, the biggest strike in the industry to that date was called. The stoppage struck hardest where the union could least afford to lose—the Central Competitive Field

and other union districts. The upshot was that a troubled industry was saddled with the 1920 peak wage, sapped in advance of the strength it needed to weather imminent liquidation and driven farther toward a crisis instead of stability.

By 1924, liquidation was going on in earnest and non-union competition, fostered by pressure-sustained wages in the union fields, was taking business from union operators. Yet, through the Jacksonville agreement, the by then burdensome \$7.50 scale was maintained, though some operators withdrew. In 1925, many more operators, after a fruitless attempt to induce modification of the "No-back-ward-step" policy, abrogated the agreement. For all practical purposes, the Jacksonville agreement was dead, though it continued to breathe feebly until 1927. The U.M.W. also was dead as an effective organization in the bituminous fields. In 1928 and 1930, defeat was admitted and districts were released to make agreements wherever they could and on whatever terms they could get.

In the anthracite industry, the pattern was much the same. A five-months strike in 1925 was a blow causing the industry difficulty even to this day.

By 1933, the U.M.W. in the bituminous field was a shadow organization. Taking into full account operator opposition, the conclusion was inescapable that militancy without need and concentration on forcing acceptance of demands to the exclusion of consideration of their effects, was the major factor in the union's collapse.

The National Industrial Recovery Act put the union back in business in 1933. The bituminous industry was organized almost completely in a quick campaign. The reasons were several, not the least being the conviction of many operators that wage stability would result. For a time, until 1937, it seemed that hope might materialize, though government intervention had begun to appear once more. By 1937, however, demands were becoming stiffer, the strike weapon was being brandished more frequently and politics was becoming more prominent. Militancy, a study of the union's course indicates, was becoming the rule at a time when militancy was least needed to achieve legitimate aims. In 1939, a successful six-weeks strike for the union shop added to the union power. In 1941, two stoppages, with settlements engineered by government intervention, exacted a wage rise and other concessions but, in doing so,

split the Appalachian Conference and broke the National Defense Mediation Board. The tendency toward exacting demands by shutting down the industry regardless of its effect was taking shape fast.

In 1943, a critical year in the war, three strikes provoked two seizures. Two more strikes marked 1945. The first exacted fringe wage increases. The second was directed at unionizing foremen. The fact that strike notices were filed before negotiations started lends weight to the conclusion that it was intended to pass quickly to the strike weapon.

The two strikes in 1946 threw impatience with bargaining into even higher relief. Again, strike notices were filed before the conferences began and a new policy of requiring settlement of each demand in turn before the next was taken up was adopted. This resulted in a breakdown of negotiations, a six-weeks strike, a contract with the government and the longest seizure yet.

Abrogation on Nov. 20 of the contract with the government was the next step. Demands were never formally announced but their far-reaching character moved Secretary Krug to suggest negotiations with the operators. The answer was "No."

## How the Public Sees It

THE BITUMINOUS SHUTDOWN that began Nov. 20 brought vividly home to the public the disastrous effects of a prolonged coal stoppage and the part played in such stoppages by Lewis, government and the legislative situation. The strike provoked many public statements that far transcended previous comments in underlining the meaning of Lewis' actions and the actions of other labor leaders to the nation generally and to the coal industry and its employees specifically.

Commenting on the work stoppage and the reaction of the nation's economy to Lewis' course, the *Wheeling (W. Va.) Intelligencer* on Nov. 21 asked some pointed questions: "Is any man or any unit of men bigger than the Government? Shall a segment of the population in position to control a vital industry be permitted indefinitely to threaten the entire public economy and the public welfare? Shall the coal dispute fire the signal for another round of crippling strikes? Shall

we have peace and prosperity or industrial strife and shortages?"

These questions added strength to later comments by Senator Harry F. Byrd, of Virginia, who said on Nov. 22, "Another surrender to John L. Lewis is unthinkable... The fight to break the stranglehold will be hard and bitter but now is the time to make clear that national strikes in public necessities must stop if our democracy is to survive."

Observers were quick to see the

★ ★ ★

"Union leadership, if it wants to be worthy of its power, must be union statesmanship, too. It must accept responsibility for national well-being and national security. These are the prices of power."

*Marion (Ohio) Star.*

★ ★ ★

effects of this stoppage and other stoppages on the coal industry itself—a loss of markets to oil and natural gas. The *Denver Post* on Nov. 20 urged conversion of the Big and Little Inch pipelines to natural gas, saying, "The coal strike last spring and John L. Lewis' threat of another strike are powerful arguments for the use of the pipelines to transport natural gas to large centers of population in the East."

With the same hard-headed realism the *Hamilton (Ohio) Journal* warned: "Some day John L. Lewis and his miners are going to wake up to the fact that thousands of them won't work, not because of the lack of a contract but because of the lack of customers. People are leaving coal as fast as they can these days."

The eagerness of hotels, apartments and industries to convert to oil and natural gas was typified in the announcement of David H. Knott, chairman, Knott Hotel Corp., New York

## High Spots in Public Reaction

1. The censure of John L. Lewis for his challenge to the government went far beyond the walls of Judge Goldsborough's courtroom.
2. A large measure of the blame for the crisis lies directly on government interference and favoritism for labor.
3. Public opinion now is integrated and will endorse measures to curb monopolistic powers.
4. Labor leaders and management, through a framework that must be provided by Congress, must search for ways and means of getting along peacefully and profitably.

City, on Nov. 23, that his company had converted two of its hotels to oil. "With the higher prices that usually follow a strike," Mr. Knott said, "oil is no more expensive than coal, and we can always get it."

Public opinion is clearly aware of the source of Lewis' power—the exemptions and immunities of labor leaders under existing laws and persistent government interference in labor-management affairs. Arthur Krock, writing for the New York Times on Dec. 8, attributed the growth of Lewis' strength to his influence over his men, wartime concessions, "statutory advantages and immunities," "the tolerance of courts and peace officers for infringement of the laws against property and public order," "the absence of a legal ban against organizing nation-wide industries" and "Supreme Court decisions that exempted union activities from restrictions against conspiracy and monopoly."

Along with Mr. Krock, many others blame the government for the situation. For example, on Nov. 17, the Columbus (Ohio) Dispatch said: "The government has used labor as a political pawn too long for the nation to hope to escape the consequences if labor seeks now to continue the game and to take advantage of its position." And the Frederick (Colo.) Miner on Nov. 14 declared that the coal industry "must be kept healthy and permitted to go ahead without government hindrance or shutdowns."

When the strike ended Dec. 7, Senator C. Wayland Brooks, of Illinois, looked to the future. The strike and its end, he said, are "a challenge to the best minds in labor, industry and the Congress to devise means of preventing such a catastrophe ever recurring."

What, then, can be done to prevent a recurrence? It is generally agreed that the remedy must be sought in the causes. Dr. Ralph Roby, chief econo-

mist, National Association of Manufacturers, put it clearly on Dec. 6: "If the labor situation is to be corrected, it is necessary that unions, no less than business, be prevented from following policies which are contrary to the public interest. Violence, financial irresponsibility, monopolistic practices, conspiracies against the public interest and the exercise of anti-social special privileges are no more to be justified in the case of labor than they are in the case of business."

To this end the public looks to Congress for action. As the New York Daily News declared Nov. 22, "A long-range result of all this, we hope, will be labor legislation which will somehow guarantee labor, including Lewis' coal miners, a fair shake regarding wages, working conditions and dealing with employers, but will also make these crippling strikes in key industries highly improbable if not impossible."

If the public statements of Washington lawmakers mean anything—and there is good reason to credit them because of their origin in the recent stoppage and the turn of the November elections—the labor question will be given priority when the



**"Somehow, by agreement or legislation—and we believe legislation is urgently necessary—a way must be found to assure the workers of a just and generous share of the wealth they help to create without subjecting the country to domestic wars that can destroy all wealth and hope of wealth."**

New York World-Telegram.



new Congress meets. On Dec. 7, Senator Bourke B. Hickenlooper, of Iowa, stated, "I am glad the miners are going back to work. That meets the thing of immediate importance, the production of coal. But other vital issues must be met and settled—the threat of recurring situations hanging over the head of the American public. That issue and its solution must be one of the first problems of the new Congress."

Other Washington legislators were of the same opinion. To mention only one among many who spoke for the press when the strike ended, Representative Charles A. Halleck, of Indiana, declared, "Congress has a responsibility to enact labor legislation that will be constructive but not punitive and will give first consideration to the welfare of the nation."

### Should Deal With Causes

One of the most energetic and thoughtful members of Congress now searching for an answer to labor upheavals is Senator Joseph H. Ball, of Minnesota. In the New York Times on Dec. 8, he reviewed the drift of a large segment of public opinion, the hazards of a legislative program and, while admitting that legislation is not the whole answer, offered his own chart for Congressional action. He wrote, in part, as follows: "Our labor relations in the United States, whether harmonious and stable or belligerent and chaotic, are the sum total of hundreds of thousands of individual negotiations between employers and unions, carried on within the pattern and according to the rules of national policy... Hurriedly drafted legislation to meet a particular crisis and treating symptoms rather than causes... has failed miserably. This time Congress should deal with the causes, take whatever time is necessary to formulate sound legislation and not be stampeded into trying some hastily drawn panaceas... Inevitably, the needed legislation will be labeled anti-labor. We should not permit that label to deter us if the changes are sound in principle. Our legislation will be no more anti-union than were the anti-trust and Securities Exchange Acts anti-free enterprise."

These, then, are the opinions of the people, expressed through newspaper columns and their elected Congressional representatives. They make it clear that American industry now has an opportunity exceeding any it has had since 1933. The opportunity is a challenge to thoughtful planning and industrial statesmanship in arriving at good labor relations.

# What the Miner Thinks



WHAT does the miner think about work stoppages and the troubles that have beset the coal industry and the nation in 1946 and earlier years? What does he think is the way out? What is his idea about the future of the industry and his part in it?

To find out what the heretofore silent factor in the coal-mining picture has to say, *Coal Age* asked him—or enough like him to arrive at the direction of his thinking. It is as follows:

1. The miner is tired of strikes but still is willing to follow Lewis. However, he is beginning to think there should be some other way out besides work stoppages and is inclined toward the idea that he should have more of a say.

2. The miner feels that government intervention interfered with settlement. He is against outsiders trying to decide matters between him and the operators and feels that there are things that can be done to reduce the number of work stoppages.

3. The miner thinks his company and management are pretty good. But he is of the opinion that his company is making at least a fair profit and possibly is doing better than well. He feels further that his earnings are no better than those of workers in other industries.

4. The miner is not too concerned about competition and so far feels that work stoppages and higher wage costs are not particularly pertinent. Better management, he thinks, is the big answer, although he inclines to the machine and is beginning to suspicion that work stoppages and wage increases

may, after all, have something to do with competition, jobs and earnings.

These and other conclusions, to be analyzed more fully in the following material, were reached by asking miners some 23 questions the week beginning Dec. 2. The poll was conducted by the McGraw-Hill research organization under the direction of John C. Spurr. Opinion was sampled by asking a number of miners in various fields for their answers and comments. This is the method generally used by organizations polling public, worker and other opinion and has been proved in practice.

Those questioned in the *Coal Age* poll were bituminous members of the United Mine Workers who had mining jobs when the Nov. 20 strike began. Areas covered were the Middle West, East and South, including the states of Indiana, Ohio, Pennsylvania, West Virginia and Kentucky. They included some areas still predominantly hand loading, some newly mechanized and some with long experience in mechanical mining. They also included areas where there was a long history of union organization and others where the union is relatively new—at least in any strength.

Men interviewed were both old and young and with a little or a lot of experience in coal mining. Some were foreign-born. Others were colored. On the whole, the poll-takers, who included Mr. Spurr and some of his associates, found those interviewed friendly and cooperative, including local union officials encountered. Since many of the interviews took place in

the miner's homes, the feminine viewpoint also is reflected.

*Coal Age* was after opinion as it existed during the strike period and after Lewis and the government had come to grips in court. For that reason, anthracite was excluded, although it probably could be assumed that the results there would have been somewhat the same under similar conditions. Since the poll was taken when the men were idle, were regarding the coming of the holiday season with some misgivings, had no idea when they would go back to work and were confronted with the picture of Lewis on trial, it is logical to believe that the results are near the bedrock of miner opinion as it exists today.

## Strikes and Striking

The miner thinks there have been too many strikes in the past five years, but pins the responsibility on the operators and the government rather than on Lewis. He feels strongly that the Nov. 20 stoppage was against the operators rather than against the gov-

### ☒ Too Many Work Stoppages in the Last Five Years?



ernment. The fact that the government had seized the mines and was in control made little difference in his attitude on striking Nov. 20. If he had been drawing a U. S. paycheck, however, he still would have been inclined to feel he should obey a strike call but was more of the opinion that he should not be called out if such were the case. He definitely feels, however, that in the future he should have a chance to vote on strike calls by secret ballot.

The burden of work stoppages has borne heavily on the miner in late years, according to comment accompanying the vote on whether there had been too many work stoppages in the past five years. That vote was 60 percent "Yes," 28 "No" and 12 percent "No opinion." "Too much strike" was the conviction of one 66-

year-old Slovak with over 30 years in the mines, during which time he had saved money and raised a family. A colored hand loader with 28 years' experience said: "I don't believe in no strikes. Everytime we gets one I gets in a hole."

An Italian with ten children and 13 years in the mines was more forthright: "I joosta wanna go back to work tomorrow. What the hell I care about Lewis, all big bosses." A coal loader with 28 years of experience had it thought through a little farther. "I wish they would do something," he said. "It's pretty tight. Christmas is on hand. There's very little to eat. I haven't any coal and can't get any. I think I'll go back to west Kentucky, where I come from and get me two old mules and quit this coal business."

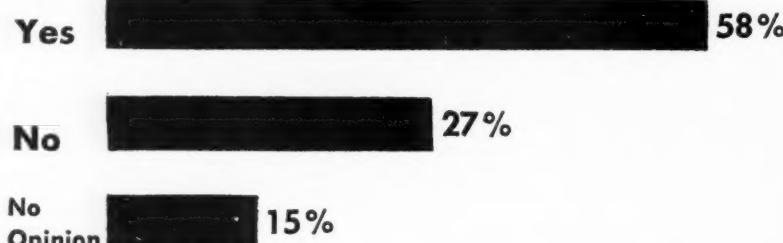
Generally speaking, the poll takers

reported, the miners did not see any reason for being called out Nov. 20. They did not want to go out and they wanted to get back as soon as possible. They did not know what their grievances were. They did not know what the union was demanding or what the government or the operators were offering. They felt that the government contract was the best they had ever had and would like to have continued with it, though they would like to see it taken over by the operators.

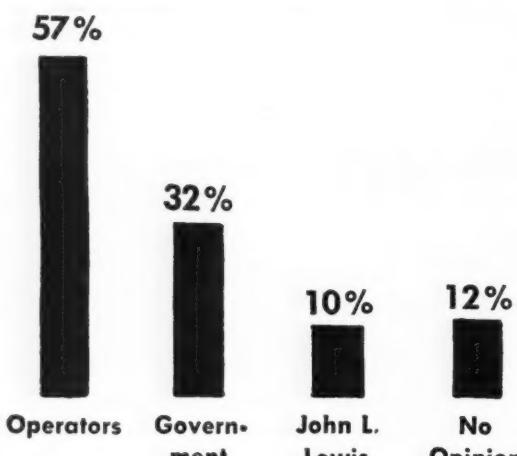
Where the responsibility for work stoppages lies brought out some lively comment in addition to the vote: operators, 57 percent; the government, 32 percent; Lewis, 10 percent; no opinion, 12 percent. In this and a few other instances in this text and in the charts, the percentages add up to more than 100 because the man interviewed insisted on indicating more than one of the alternatives. Said one local secretary, 39 years in the business: "You can tell Truman, Krug or anybody else what I say. Money men are behind this strike. This Big Inch pipeline business is behind this strike. They couldn't have gotten the pipeline into operation only because of the strike. These money men are either in or out of the union, but they're putting their own selfish interests first."

The miner was pretty definitely of the opinion that the Nov. 20 strike was not against the government but the operators. The vote was: against the operators, 69 percent; the government, 15 percent; no opinion, 18 percent. Many of those interviewed said

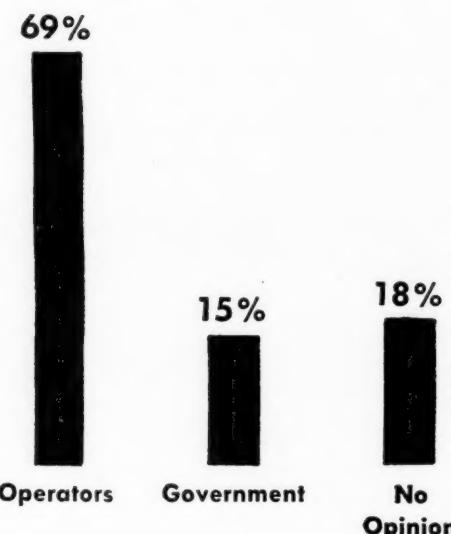
### Did Government Seizure Last May Prevent Agreement With Operators?



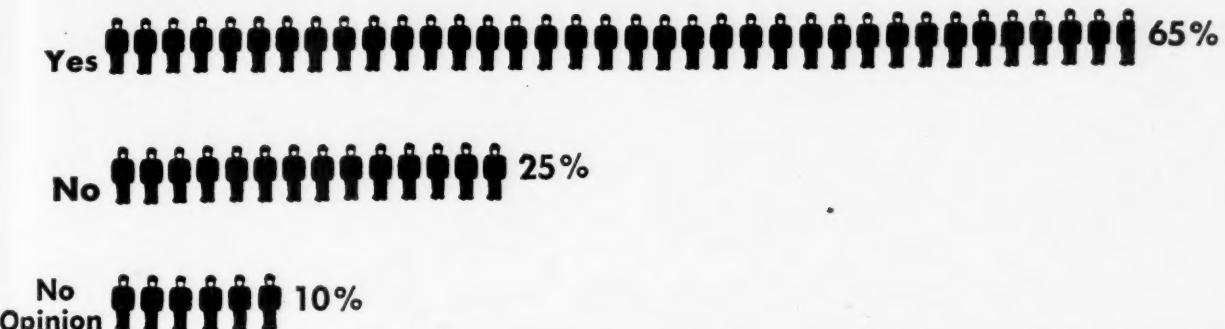
### Most Responsible for Strikes?



### Real Parties Nov. 20 Strike Was Against?



### Should Miner Vote Secretly on Future Strike Calls?



that the coal company's name was still on their paychecks and the same bosses were on the job. Therefore, it looked to them like they were still dealing with the operators.

That feeling probably figured very heavily in their vote that government control made little difference in their attitude toward striking on Nov. 20. Only 24 percent were more reluctant while 76 percent said it made no difference in their going out. But if the government really owned the mines and the paycheck came from the U. S. treasury, their attitude was a little different, although 36 percent said they felt they would have to obey a strike call. Some 50 percent felt they should not be called out, while 14 percent had no opinion. The size of the vote for obeying a strike call under such circumstances supported other evidence that the miner, come what may, still is ready to follow Lewis. "Sorry for people suffering but John L. for me," as a laborer with 10 years in the mines put it, was the frank summary of a rather general opinion. Equally prominent was the other idea of "No contract, no work," summed up thus: "We didn't stop against anyone. We just didn't have a contract to work under."

#### Government Disliked

It may come as shock to those on the public payroll, but the miner doesn't think much of the government's role in contract settlement. In fact, he cares very little for any outside intervention. On the question of whether the seizure of the mines last May prevented a settlement with the operators, his vote was 58 percent "Yes," 27 percent "No" and 15 percent "No opinion." Some of the comment was brutally blunt. "If the government had stayed out, it would have been settled long ago," said a miner 15

### Attitude on Striking with Government in Control?

#### More Reluctant

24%

#### Made No Difference

76%

### Attitude if Government Owned the Mines and Miner Were Drawing a U. S. Paycheck?

#### Would Have to Obey a Strike Call

36%

#### Should Not be Called Out

50%

#### No Opinion

14%

years in the business. A snapper, 20 years on the job, felt that "The government should give the mines back to the owners and let them both meet." Another miner with 42 years of experience had a broader view: "If wages and prices had been frozen by the government, none of this would have happened."

But there were other viewpoints. An Austrian Socialist, 30 years in the

mines, contended: "The union should own the mines." A Croatian coal cutter, 26 years at work, declared: "If the government should be in the picture, it is just like Russia, not America. This country is supposed to be free."

Another surprising result of the poll was the sentiment in favor of a secret vote by the union membership on whether strikes should be called in the future. Some 65 percent of those

interviewed were in favor, while 25 percent were against it and 10 percent had no opinion. This vote was accompanied by some voicing of dissatisfaction with the leadership of the union and a desire for more participation in other directions. "Union badly led" was the opinion of a young veteran now working as a motorman who remembered the wartime strikes. A loader, 20 years in the mine, said: "Too much steam-roller tactics now." "The union should let the locals have more power," a timberman with 20

years of mining experience contended.

It probably comes as no surprise to the operator that the miner puts the big share of the responsibility for strikes on him, although he will be pleased to learn that he now has a companion—the government. A question that arises, however, is whether, if the miner were fully informed of the facts, he still would assay responsibility the same way. The evidence indicates that the miner is not too happy with the strike situation and is beginning to wish union officials would

act a little differently. Consequently, it would appear that he would welcome sincere and informed opinion on what might be done—an opportunity for the operator.

## Making Agreements

The miner thinks that agreements could have been and can be made without so many work stoppages. He thinks the operators and the union could get together if they tried harder and he certainly does not like the idea of any outsider deciding industry questions. However, rather than work stoppages in the future if the parties should fail to get together, he looks with favor on arbitration if the arbitrators are chosen by both sides.

Questioned on whether they felt the United Mine Workers could have made agreements without work stoppages, 45 percent of those interviewed voted "yes," 44 percent "No" and 11 percent "No opinion." They also felt that there had not been a real effort to negotiate. When asked if they felt that would have helped, 90 percent voted "Yes," 5 percent had no opinion. The miners also were questioned on whether a more reasonable attitude on the part of the operators, the union or the government would have helped. The majority felt

### In Case of Disagreement and to Prevent Strikes in the Future, Would Prefer Settlement Be Made by:

A Government Board

11%

Arbitrators Chosen by Both Sides

74%

No Opinion

15%

### Can Operators and Miners Do More to Get Together in the Future Without Work Stoppages Through:

More Real Effort to Negotiate

90%

5%

5%

Yes

No

No Opinion

Setting Up Permanent Joint Board

73%

11%

16%

Yes

No

No Opinion

Outside Referee to Decide Disputes

57%

32%

11%

11%

Yes

No

No Opinion

that the operators should have done better but there was substantial opinion that neither the union nor the government had shown as reasonable an attitude as they should.

Getting together would have been facilitated by a permanent joint board of operators and miners, those interviewed felt. The vote was 73 percent "yes," 11 percent "No" and 16 percent "No opinion." An outside referee was not looked upon with great favor on the basis that he would not be a man chosen by those in the industry and could not know coal mining well enough to hand down a fair and realistic decision. Only 32 percent voted for this method of getting together without work stoppages in the future, while 57 percent voted against it and 11 percent had no opinion.

Thinking on outside intervention was confirmed by the vote on the question, in case operators and miners could not get together in the future, of having wages and working conditions

settled by a government board or by arbitrators chosen by both sides. The vote was only 11 percent for a government board, 74 percent for arbitration and 15 percent "No opinion."

While comment supported the vote that more reasonableness on the part

of the operators would have helped in making agreements, it also indicated that many miners were thinking of the roles of the union and the government. "More cooperation among all three" was a frequent statement. One of the reasons miners dislike govern-

Could U.M.W. Have Reached Agreements by Other Means Than Striking?

Yes

45%

No

44%

No  
Opinion

11%

Does Miner's Company Try to Treat Him Fairly?

Yes



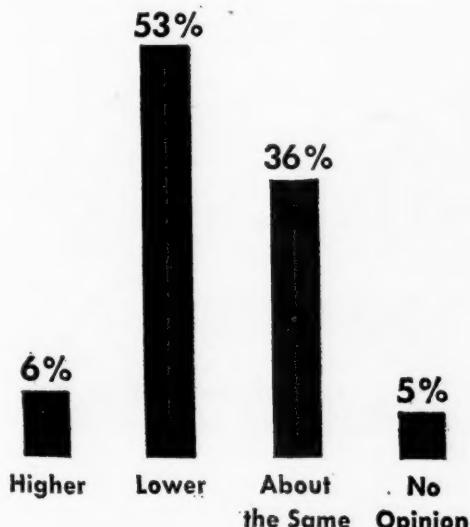
79%

No

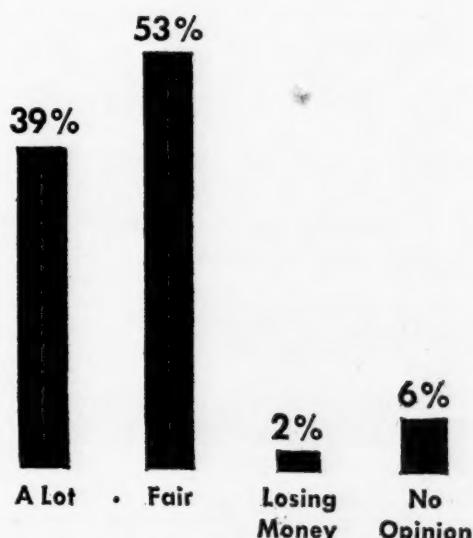


21%

Miner Earnings Compared With Earnings in Other Industries?



Opinion of the Profit His Company Is Making?



ment intervention apparently is a long-held distaste for the bias or lack of knowledge shown by outsiders. "Depends on who is the referee and what is his slant" was the way a machineman with 29 years of experience put it. "I don't like to see so much interference by government" was the opinion of a coal loader 38 years in the mines. "Have the government keep their noses out" said a trackman 23 years in the mines.

The evident fact that the miner prefers to do his own talking and, if necessary, battling with the operators indicates that work toward better and more continuous discussion and cooperation should lead to peaceful settlement of difficulties without work stoppages. The miner's ideas about a more reasonable union attitude and about government intervention also should provide food for thought for both union and government officials.

## Company Relations

The bituminous miner thinks his company is a pretty good outfit. He thinks that by and large it is making no more than a fair profit. However, in spite of his position at the top of the heap in earnings, he thinks they are generally lower than earnings in other industries.

Some 79 percent of those interviewed voted "Yes" on the question "Do you think that, in general, your company tries to treat you fairly?" This confirms in concrete fashion informal findings over the years that while miners regard operators as a class with suspicion, that opinion does not extend to their own companies and managements. Even though they held the operators and the government largely responsible for their problems, when

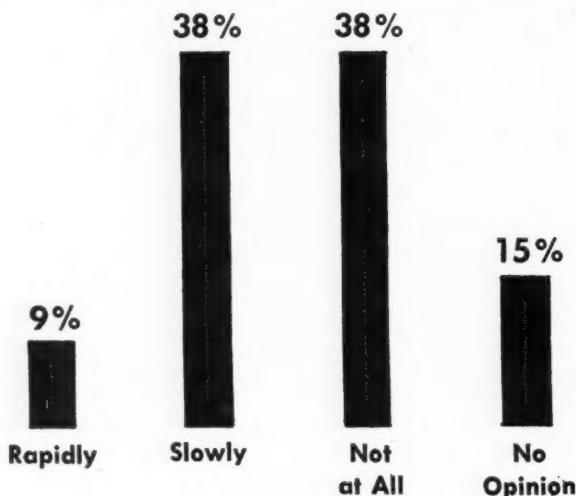
questioned about their own companies, those interviewed generally praised them as being fair and just.

"Pretty good," "All right" and similar responses were the rule in comments on this question. Some felt that there were too many intermediaries, however, between the owners and the men as compared to the union officials and their members. A tracklayer with 54 years of experience had this to say: "The owners mean to be fair but there are too many between the owner and the miner. I mean company men—not union leaders. They protect us."

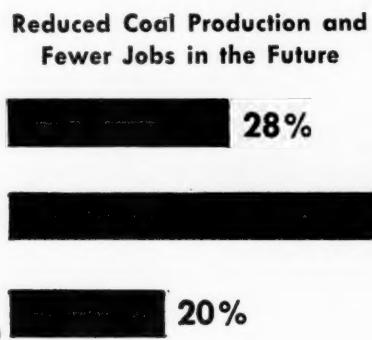
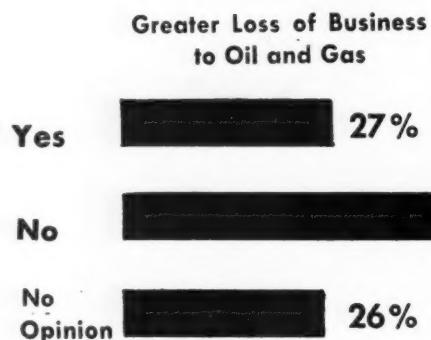
On the question of earnings compared to earnings in other industries, only 6 percent of those interviewed had the correct answer: "Higher." Some 53 percent thought they were lower, 36 percent about the same and 5 percent had no opinion. The recent car shortage in some areas affected the thinking of some of those interviewed, although it was not entirely responsible for the general impression that over the year the miner does not fare so well. A timberman four years in the mines said earnings are lower "because we don't have steady work." "We earn more when we work but less over the year" was the comment of a loading-machine operator with 25 years of experience. A handyman with 20 years in the mine said workers could make \$8 to \$15 a day in a factory whereas miners can make only the fixed day rate. As compared to factory work, mining is not so safe.

While miners tended to believe their earnings were lower than in other industries, they apparently did not think it was because the company was making an exorbitant profit. Some 39 percent only felt that their companies were making a lot of profit, while 53 percent considered the profit as fair. Only 2 percent thought their

### Is Coal Losing Business to Oil and Gas?



### Effect of Raising Wages and Shortening Hours Again Next Year on Competition and Jobs?



company was losing money, however, while 6 percent had no opinion. The possibility that the company might be losing money was laughed off because those interviewed did not see how the company could pay them money without having it, so it must be making a profit. However, as the vote shows, a lot of them thought a fair profit was closest to the truth.

In working for the future, the strong liking of the miner for his company is a sound foundation on which to build. That liking also enables the operator to start with quite a lot in his favor in getting the facts to the miner and creating a real desire on his part to work with his employer and with the industry. Starting with that opinion, the operators should be able to dispel more easily misconceptions concerning earnings and company and industry profit position. If that could be supplemented by a greater degree of regularity of work through better planning and better sales by increasing efficiency and raising quality, the industry could take a long step forward on the road to greater cooperation.

## Competition

The miner does not think oil and gas competition is particularly important at the present but is beginning to suspect that increased wage costs, work stoppages and other burdens are beginning to have an effect. In meeting competition, he is inclined to think it is a matter of management and machinery more than reduction in work stoppages and caution in raising wages and shortening hours.

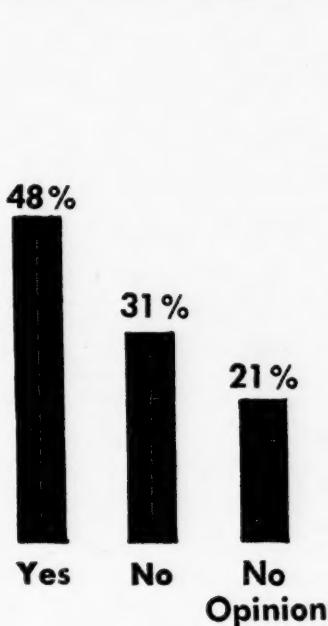
Only 9 percent of those interviewed think competition is gaining rapidly at the expense of coal. Some 38 percent think the gain is slow. Some 38 percent also think it is not gaining at all, while 15 percent had no opinion. "Just a little shade" or "No sir" were typical comments.

In spite of their answer to the general competition question, the miners interviewed apparently were becoming conscious of oil and natural gas. When queried as to whether raising wages and shortening hours again next year would result in greater loss of business, less than half (47 percent) voted "No," while 27 percent voted "Yes" and 26 percent had no opinion. Some 52 percent voted "No" when asked if lower coal production and fewer jobs would result in the future, while 28 percent thought "Yes" and 20 percent had no opinion.

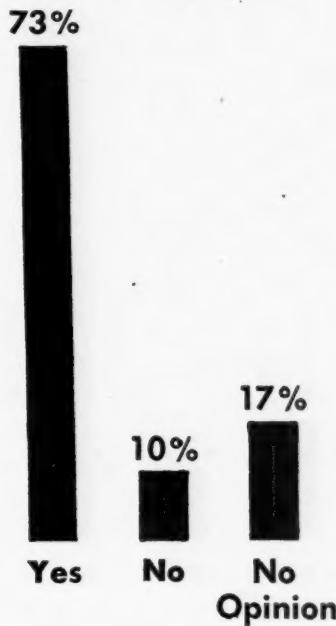
The suspicion that oil and gas is or could be a factor was brought out a

## How Oil and Gas Competition Can Best Be Met?

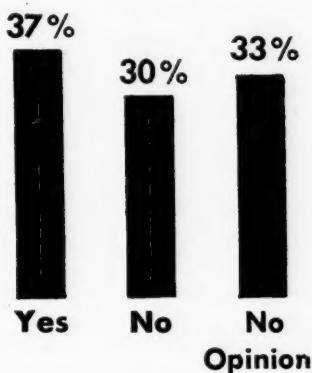
Fewer Work Stoppages



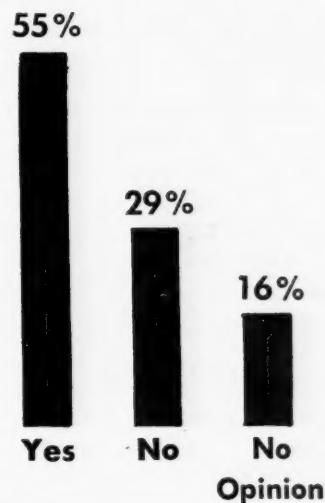
Better Management



More Caution  
in Raising Wages  
and Shortening Hours



More Machinery and  
Better Methods  
to Raise Tons per Man



little more clearly in answers to questions as to how it might be met. Nearly half (48 percent) thought fewer work stoppages was one answer, while 31 percent voted "No" and 21 percent had no opinion. More machinery and better methods to raise tons per man were seen as another answer by 55 percent, while 29 percent voted "No" and 16 percent had no opinion.

Better management led the list in miner thinking on meeting competi-

tion, while caution in raising wages and shortening hours ran a poor fourth. Some 73 percent thought better management was a good answer, against 10 percent "No" and 17 percent no opinion. Only 37 percent thought caution in raising wages and shortening hours was an answer, while 30 percent thought it was not and 33 percent had no opinion.

The poll revealed that there still remains an undercurrent against the machine, although the majority ap-

proved it as a weapon against competition. "Too damn many machines now," "Machinery would do me out of a job" and "More machinery would cut cost by laying men off, which I don't like," were typical comments.

Since the opinion of the miner represents a help or a hindrance in taking steps to meet competition, the poll shows that some highly important educational work is necessary—necessary so that the miner understands what competition means, what the industry is doing and what he can do.

Since he is beginning to realize that there may be something to the problem, the soil already is partly fertilized.

Over all, the thinking of the miner as brought out in the *Coal Age* poll, shows significant gaps in his knowledge and significant opportunities for the operator in furthering understanding and promoting cooperation. That is the big conclusion to be drawn from the results. The opportunities line up about as follows:

1. Development of a better means of reaching agreements, thus satisfying

the miner's desire—and that of the industry and the public—for peace and elimination of work stoppages.

2. Capitalizing on the liking of the miner for his company and his management by giving him the facts and thus making him more disposed to align his interests with those of the industry.

3. Enlisting the miner's aid in the battle against competition, again by giving him the facts, and thus gaining his material help in meeting the problem.

## The Job Ahead for Coal

AS CHIEF SUFFERER in recent developments in labor relations, coal is especially in need of a program assuring fair and mutually beneficial relations between employers, employees and employee representatives. Not only is such a goal in the interest of the coal industry, it is in the public interest. It is not too much to say that continuation of the industry as a private enterprise depends not alone on a fair settlement of the present controversy but on how well all parties at interest work toward cooperation and an end to strife, controversy and—particularly—work stoppages in the future.

To get on a fair labor-relations basis,

coal has perhaps four obstacles to overcome and problems to solve: the union approach, governmental attitude, the attitude of the miner and public opinion. The union approach has so far been the biggest obstacle, although a changed administrative and legislative outlook and the pressure of public opinion are favorable developments. Winning the miner's cooperation, as well as that of union, and getting on good terms with the public remain as problems, however. What the industry does, how it does it and when it does it are critical factors in achieving desired results in the future.

Looking at the situation from another viewpoint, the necessary action

must come from both within and without the industry. An example of the latter is revision in legislation and administrative policy to establish a fair and impartial governmental attitude toward labor relations—an attitude putting the public interest where it belongs: first. Since legislative and administrative partiality have been directly responsible for the growth of situations leading to losing sight of public interest, not to mention that of industry and its employees, it logically is the starting point in reform. Coal, by all means, must be ready to work closely with Congress and also ready to provide concrete suggestions for needed reforms aimed at fairness for all.

Some of the reforms operators might urge on Congress include the following:

1. Require all parties to bargain collectively where such bargaining is in order—worker representatives as well as employers.
2. Require government agencies dealing with labor relations to consider public and industry interests, as well as that of workers.
3. Protect the right of management to manage by excluding supervisory, confidential and other managerial employees from organization.
4. Protect government and the public from attempts by representatives of organized labor to levy taxes on production.
5. Make clear and safeguard the right of the worker to join or not join a union as he chooses, free from coercion from any source.
6. Eliminate union membership as a condition in employment or retention of a job.
7. Deprive of the protection of the

### THE LEGISLATIVE TREND

"What he would like to have in the law is a clear concept of labor's responsibility to the people and the government."—Statement Dec. 10 by an associate on President Truman's plans for recommendations to Congress.

"This tragic experience is a challenge to the best minds in labor, industry and the Congress to devise means of preventing such a catastrophe ever occurring."—Senator Brooks, Illinois.

Congress must enact labor measures "that will be constructive but not punitive and which will give first consideration to the welfare of the country as a whole."—Representative Halleck, Indiana.

"But other vital issues must be met and settled—the threat of recurring situations hanging over the head of the American public. That issue and its solution must be one of the first problems of the new Congress."—Senator Hickenlooper, Iowa.

"We should have adequate legislation to see that such a situation cannot be repeated."—Representative Case, South Dakota, author of the Case bill.

"Will strengthen the hands of those who want to see firm and well-balanced labor regulation."—Senator Millikin, Colorado, in commenting on Lewis' decision to bow to the courts.

law strikes involving issues not related to wages, hours and normal working conditions—sympathy strikes, strikes against government, strikes to force employers to ignore or violate the law or contracts, strikes to enforce feather-bedding or other restrictive work practices, secondary boycotts, etc.

8. Prohibit violence, violation of civil liberties, blockading of plants, mass picketing, attacks on individual workers and other forms of coercion or intimidation of either the employer or the individual.

9. Return to the employer the same right to present his case to his workers the union now has alone.

10. Provide that, upon request by any interested party, workers shall have the opportunity to vote by secret ballot on the latest offer of the employer before a work stoppage takes place.

11. Relieve employers of the burden of negotiating on a national basis.

12. Make labor unions and their officials, as well as the employer, responsible for contract observance.

13. Make labor unions and their officials equally responsible with business for observing the laws governing monopoly and restraint of trade.

14. Protect freedom to strike where there is a legitimate difference of opinion over wages, hours and normal working conditions that cannot be reconciled by collective bargaining and where the union otherwise complies with the law.

It is evident from the preceding that existing federal statutes dealing with labor relations, of which the principal one is the Wagner Act, need extensive revision. That revision, however, should not be undertaken as a means of depriving employees of the right of voluntary association and selection of representatives for bargaining collectively. Rather it should preserve and promote fairness in the process, while leaving to those workers who desire it complete freedom to act as individuals without fear of coercion or discrimination.

Other legislation promoting union monopoly and burdening the employer and the public includes the Norris-LaGuardia and Fair Labor Standards acts. The injunctive process undoubtedly was abused in the past, leading to the passage of the Norris-LaGuardia Act, but recent events have shown that it affords a protection otherwise impossible to secure. Revision of the act is an obvious necessity.

Under the Fair Labor Standards Act, employers have been subjected to severe penalties because of sudden changes in rulings involving them in

## CHALLENGE AND OPPORTUNITY

### Problem:

Strikes, public inconvenience, loss of business and miner and public reaction through inability to reach peaceful settlements between union and operator.

Lack of cooperation between miner and operator because of lack of understanding and absence of machinery to make working together more possible.

### Favorable Factors:

Freedom from blame by the public for recent stoppages and their consequences.

Determination in government and among legislators to provide a fairer basis for labor relations.

Freedom from miner resentment and bitterness over the recent stoppages, a positive liking by the miner for his company and a desire on the miner's part for a way out other than strikes.

### The Job for Coal:

Development of a plan and establishment of an organization to translate into action its determination to win the goodwill and cooperation of the miner by getting the facts to him, setting up machinery to facilitate mutual effort and providing means for quick rectification of conditions leading to discontent and public reaction.

Strengthening of coal's public relations work, thereby promoting goodwill by making sure the man in the street knows and understands the facts.

heavy retroactive liabilities when they had been obeying the "law" as laid down by administrative procedure up to that time. The process is obviously unfair. The Act therefore should be revised to provide that when the employer has been complying with its provisions and with administrative rulings, retroactive wage payments and damages should be prohibited. A requirement that public and industry interest also be considered in administrative rulings should have a salutary effect.

Wartime "powers" also have figured in the development of the present labor-relations situation. Consequently, the legal fiction that the war is still on should be ended and all "war powers" eliminated immediately. Along with it, the War Labor Disputes Act should be repealed, since its principal results have been to lend a semblance of government sanction to strikes and give some legal color to seizure in labor disputes, which at last has been shown in its true light in addition to other drawbacks—ineffective.

### Coal's Own Job

While promotion of legislative reform is one step for coal, it has an even greater job of its own to do when it gets its mines back. That job must be done in spite of that fact—even more, because of it. Not to belabor the question, preservation of the industry as a private enterprise requires

positive action to get on a truly sound basis of relations with mine employees. Settling back with the idea that nothing more need be done will not remedy the basic situation. Thus, the industry would be left vulnerable to further controversies and work stoppages, with the very real hazard that public impatience would result in coal being taken over even if it was not brought down by competition.

The situation is essentially this: Lewis has won many benefits for his miners. They feel at present that he is their only hope of coping with the operators although strike losses have hurt them and they would like another way out. The public, while it dislikes Lewis' way of doing business, concurs in the feeling that the miners must look to someone other than the operators for real response to their needs and desires. Coal, of course, is not the only industry in which this situation exists. Logically, it should be just the reverse and that is coal's basic problem as well as the problem of many other industries.

The order is a big one and perfection is too much to be expected in an imperfect world. But coal needs to channel its general desire to be fair—and even generous—with its employees into concrete action. Fortunately, it has a good, even outstanding, starting point—the general opinion of the miner that his company is a pretty good outfit and his management a pretty good bunch. He would like the

opportunity of working with management personally or through his representatives, as evidenced by the vote for joint operator-miner bodies for reaching agreements without work stoppages. By capitalizing to the fullest on that attitude and desire, coal can win the miner's cooperation and thus exert an influence on union policy possible in no other way.

Numerous operators are searching for and putting into effect the principles that promote good feeling between management and men—and with good results. First is a sincere determination on the part of all management down to the last supervisor in the line to try to find out what the worker thinks, bring that thinking into his own thinking and adjust his course as necessary for maximum results. It involves no sacrifice of managerial rights and responsibilities but does bring in a vital element. Experience at numerous mines proves it works, even without a formal organization. But there is good evidence that where joint bodies exist the results can be enhanced. In several cases, specified work periods are devoted regularly to meetings to promote mutual action. Where failures have occurred, and there have been some, the basis was wrong or the spirit lacking more often than not.

#### Deeds Prove Sincerity

Concrete evidence that the company is taking active steps to promote his interests in other ways also is a potent goodwill builder. Real evidence that "Safety is the first consideration," plus stress on obtaining the miner's participation, can achieve an objective thousands of words will not promote. The same is true of efforts toward making working conditions as pleasant, healthful and comfortable as mining limitations permit, as well as efforts toward all possible and practicable improvements in living conditions and community life where the operators have a part in providing community facilities.

Management attitude and concrete evidence of its intention to see that the miner and his family work and live in safety and comfort are long steps on the road to unquestioned friendliness. But they are not the only ones. Making sure that the miner gets a fair share of the rewards of effort toward the common goal is vital. Up to now, the operator usually has appeared as the reluctant disgorger of benefits long deserved and only extracted by force. Because of the way benefits usually have come to the miner, pointing out the facts has so

far had little effect on the general opinion of the operator held by the miner and—equally important—the public.

Analysis of the situation makes it logical that coal should translate its desire to see that the miner gets his rightful share into action based on continuous study of industry and miner position and a firm intention to make adjustments when adjustments are indicated. In short, when the industry situation warrants additional benefits, they should be granted in full. Hard, purposeful thinking and prompt action in this direction will go far toward removing one of the biggest causes of controversy and public reaction.

#### Education Vital

To translate friendliness into cooperation and make action on benefits count to the fullest, the miner and the public must be given the facts. The miner is the more important factor in the equation because if he is informed and satisfied, the big reason for controversy and strike action detrimental to industry interest is eliminated. Driving the facts home would, as an example, undoubtedly change the miner's impression that he does not fare too well in pay, as shown in the results of the Coal Age poll. Driving the facts home also would change his opinion that oil and gas competition is no great threat and is little affected by work stoppages and by increasing wage costs faster than progress in efficiency warrants. Regular, down-to-earth presentation of industry problems, what it is trying to do about them and what part the miner can play is a job that will pay dividends to the industry and to every company and individual in it.

Along with winning miner friendliness and cooperation, coal still has the vital problem of getting the facts to the public—a problem made more difficult as a result of the ground lost as a result of the 1946 controversies and work stoppages, with consequent inconvenience and distress to the man in the street. The public has learned to dislike the methods used to gain benefits for the miners because it has experienced the results. But it still does not feel, according to available indications, that the miner has reached the position in pay, working conditions and living conditions he should have. Getting the facts to the public is now more vital than ever before. It should and must go hand in hand with improvements in relations with the mine workers.

Determination, a plan and organization might be set down as the key-

stones in coal's program of assuring better labor relations and gaining union and miner cooperation in promoting better service to the public. The history of the immediate past and the necessity of avoiding a recurrence of strife and production interruptions in the future should reinforce the determination. Study of that same past history and of miner ideas and public opinion should supply the plan.

Organization is perhaps the vital ingredient in promoting harmonious relations and cooperation. As the situation now is, coal is organized solely to negotiate the terms of contracts. To attain the other and more vital goal, it must also organize so that it can work to gain employee help in attaining industry objectives. That organization, analysis of the situation indicates, should have as its primary goals:

1. Education—getting the facts on the industry and his part in it to the miner.
2. Working out and setting up machinery so that the miner and the operator can work together in areas where mutual effort will advance the interests of the industry.
3. Providing a means for quick rectification of conditions in coal mining that experience has shown lead to miner discontent and public reaction.

#### Miner the Key

Coal has been the vehicle and strike action the key to outstanding examples of inconvenience, higher costs and foreboding growing out of union activities in recent years. Increased resentment and conversion to other fuels has been one reaction. Another—and equally important—is perpetuation of the belief that mines are horrible places, that workers are at the mercy of mercenary operators and that the miner is a long way from a fair break even in earnings. Despite the fact that these beliefs are not fully shared by the miners, the blunt fact is that the public has been getting hurt and in turn coal is getting hurt. And when the industry gets hurt, everybody in it, including the worker suffers injury. However, coal's hurts are not yet mortal and if peace and cooperation between miner and operator can be assured, the future is promising. Legislation is important but the key is the miner.

Coal has been granted another opportunity to submit further proof that it can cope with its major problem: labor relations. By solving it, it can expect to win public and miner goodwill and cooperation and profit through better service to the consumer.



One of three track-mounted loaders averaging 540 tons per shift. The dirt shale band, scaled down, exposes good limestone roof.

## PREFABRICATED TRACK Boosts Track-Loader Tonnage at Norco

Average of 540 Tons per Machine-Shift in 6-Ft. Coal Reflects Coordination of Equipment and Methods Plus Big Cars and Prefabricated Track for Quick Service to Track-Mounted Loaders

By RALPH R. RICHART  
*Associate Editor, Coal Age*

RECENT ARRIVAL of long-awaited track cutters ushers in the final phase in the mechanization program at the Norco East No. 1 slope operation of the Norton Coal Co., Nortonville, Hopkins County, Ky. In 1943, when the management converted the mine from a shaft to a slope operation, the groundwork was laid for working the No. 11 seam with coordinated equipment. Already tied to track haulage, and because a soft bottom ruled out any consideration of rubber-tired haulage, it was decided that track-mounted equipment would be used throughout. In laying out the

new system the management tried to avoid the production bottlenecks experienced in the old operation, one of which was car changing. Eight-ton Sanford-Day drop-bottom cars and Goodman 460 loaders were installed along with 40-lb. 42-in.-gage prefabricated track. Three loaders, double shifting, load approximately 3,250 tons of raw coal per day, or more than 540 tons per machine-shift. Wherever a track cutter cuts for a loader, 18 men constitute a crew. In the sections where shortwalls are used, the crews number 22 to 23 men. The eight-car trips dump into a 250-ton surge bin sunk below the seam at the foot of the slope and the coal is fed by belt to the tipple and washery.

After two years of experience with prefabricated track the management as

well as the operating department are still very much sold on the idea and are convinced that it was a wise move. Use of prefabricated track was suggested by A. K. Hert, general manager, Snow Hill Coal Corp., Terre Haute, Ind., according to Sterling S. Lanier Jr., president of the Norton Coal Co. Mr. Hert made this suggestion as Norton's plans were being formulated.

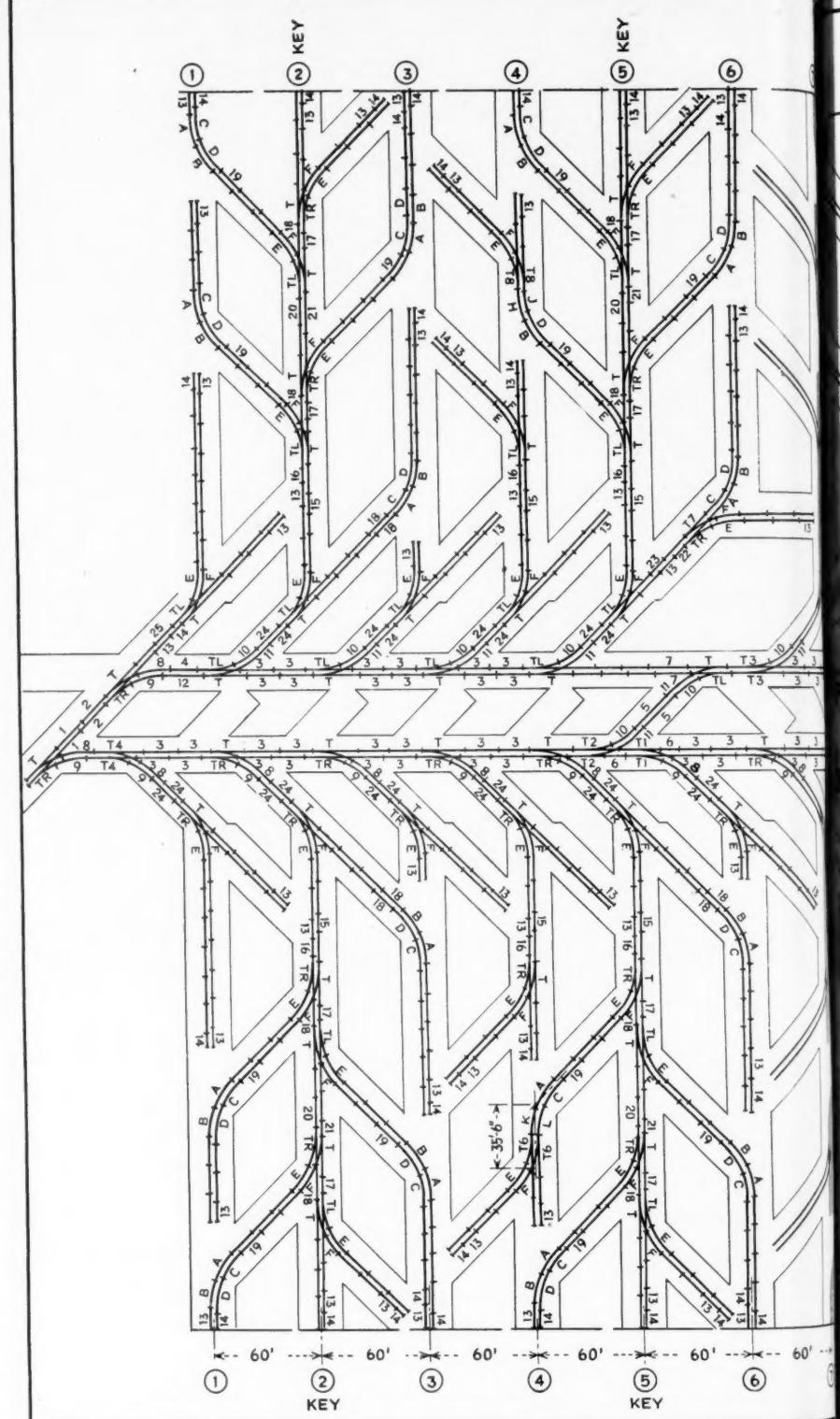
As previously described by Lindsay Cobb, assistant general superintendent (*Coal Age*, January, 1945), the track layout comprises 52 different pieces of rail and was fabricated by the West Virginia Steel & Mfg. Co. The track system, shown in Fig. 1, uses a three-room key plan in which the center room of each group of three carries the main haulage road for the other

Rail Lengths			
Straight		Curved	
No.	Length	No.	Length
1	20' 0"	8	18' 9 $\frac{1}{8}$ "
2	19' 7 $\frac{3}{8}$ "	9	16' 5 $\frac{3}{8}$ "
3	18' 0"	10	16' 5 $\frac{3}{8}$ "
4	16' 2 $\frac{1}{2}$ "	11	18' 9 $\frac{1}{8}$ "
5	24' 8 $\frac{1}{2}$ "	R1	18' 4 $\frac{1}{8}$ "
6	11' 5 $\frac{1}{4}$ "	R2	18' 9 $\frac{1}{4}$ "
7	20' 8 $\frac{5}{8}$ "	R3	19' 9 $\frac{1}{4}$ "
12	23' 1 $\frac{1}{2}$ "	R4	20' 2 $\frac{3}{8}$ "
13	12' 0"	L1	18' 4 $\frac{5}{8}$ "
14	8' 0"	L2	18' 9 $\frac{1}{4}$ "
15	11' 1 $\frac{1}{4}$ "	L3	19' 9 $\frac{1}{8}$ "
16	4' 2"	L4	20' 2 $\frac{3}{8}$ "
17	7' 6 $\frac{3}{4}$ "	A	18' 2 $\frac{1}{8}$ "
18	14' 8 $\frac{1}{4}$ "	B	16' 6 $\frac{3}{4}$ "
19	15' 1 $\frac{1}{4}$ "	C	16' 9 $\frac{1}{8}$ "
20	16' 6 $\frac{1}{4}$ "	D	22' 1 $\frac{1}{8}$ "
21	7' 5 $\frac{1}{4}$ "	E	17' 11 $\frac{1}{8}$ "
22	8' 2 $\frac{5}{8}$ "	F	14' 4 $\frac{3}{8}$ "
23	11' 7 $\frac{3}{8}$ "	G	20' 5 $\frac{5}{8}$ "
24	16' 2 $\frac{1}{4}$ "	H	17' 2 $\frac{1}{8}$ "
25	13' 1 $\frac{1}{2}$ "	J	12' 4 $\frac{7}{8}$ "
		K	15' 6 $\frac{3}{4}$ "
		L	17' 6 $\frac{1}{8}$ "

Fig. 1—Panel and prefabricated track layout used in a 36-room panel at Norton.

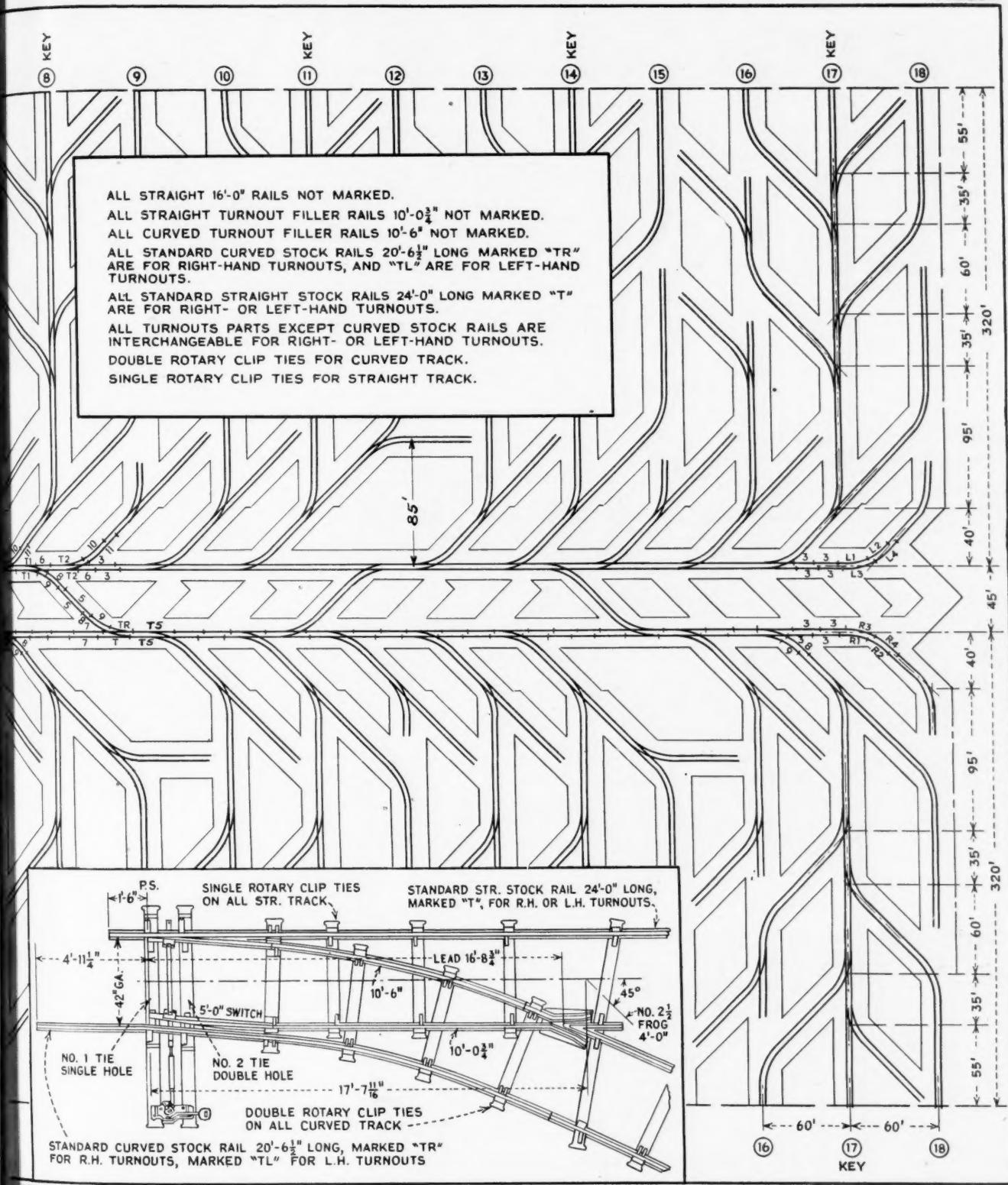
two. On the panel drawing, each rail is designated by a number. For example, the standard curved rail to the left leading into a roomneck is shown as TL and bears a welded nameplate marked TL. The right-hand standard curved stock rails are all marked TR. Each TL and TR rail is the same length—20 ft. 6 $\frac{1}{2}$  in. Every rail is marked except the standard 16-ft. straight rails and the standard turnout filler rails. All turnout parts, except curved stock rails, are interchangeable for right- or left-hand turnouts. Double-rotary-clip steel ties are used on curved track and single-rotary-clip ties on straight, or tangent, track.

With prefabricated track, the places have to be driven to fit the track and not the track laid to fit the places. Consequently, the rooms are driven on sights much more closely than in many operations where track is laid the conventional way. Each loader crew includes three track men and the track



must be laid up to within 5 ft. of the face in all places. Their tools consist of a wrench and a hammer. While memorizing the track layout the track men did refer to a blueprint. Now, however, they have thrown the print away. Three trackmen will lay as many as 16 to 18 places per shift, including switches. They will reclaim the steel from 1 $\frac{1}{2}$  rooms and deliver it to the place where it is needed in one shift. In the beginning some observers

thought it would be necessary to stock enough track to lay six full key-room units, 18 rooms in all, for each loading machine. With the track then costing about \$1,000 per 320-ft.-long room, the investment per loader in track alone would have been \$18,000. However, it was soon proven that a loader could do pretty well on very few rooms. During a period when track shipments were slow one loader cleaned up as many as 23 places in a



shift using only two sets of key-room track (six rooms) plus the headings. As standard practice, the mine now provides four key sets, or 12 rooms, of track for each loader.

Each panel territory consists of 36 rooms, 18 on a side, and accommodates one crew. Two 20-ft.-wide panel entries are driven on 45-ft. centers and the crosscuts between them, as well as the roomnecks, are driven 20 ft. wide. Rooms are turned on 60-ft. centers and

are driven to a depth of 320 ft. All rooms and the crosscuts between them are driven 25 ft. wide and recovery runs about 66 percent. Roomnecks and all crosscuts are turned on a 45-deg. angle.

A treacherous band of dirt shale lies immediately over the .6-ft. No. 11 seam. When over 3 in. thick, it causes more trouble some four or five cuts back of the face than it does in the immediate vicinity. That is why each

crew includes two gob men, who continually go over the territory and scale down and gob this material. Prying down the dirt shale exposes a good limestone roof approximately 5 ft. thick. Because of the strong limestone strata above the seam and a rather soft fireclay underneath it is difficult to get the limestone to break where it is desirable and pressure from one region rides over into another territory. To relieve this condition—and the man-

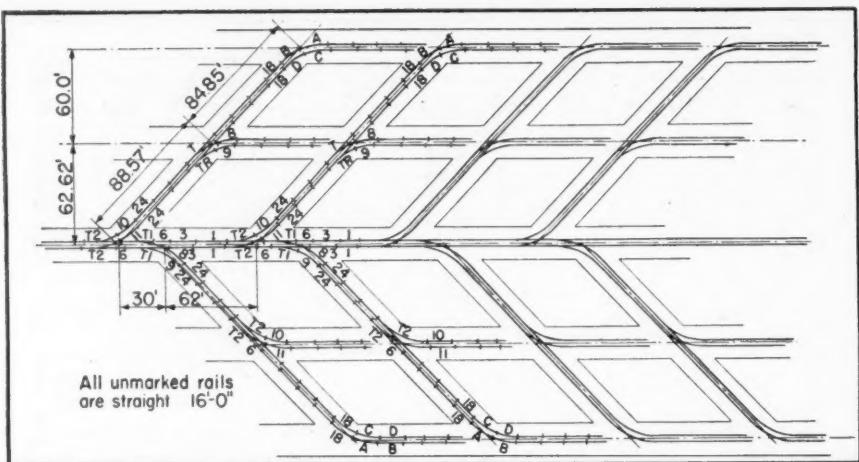
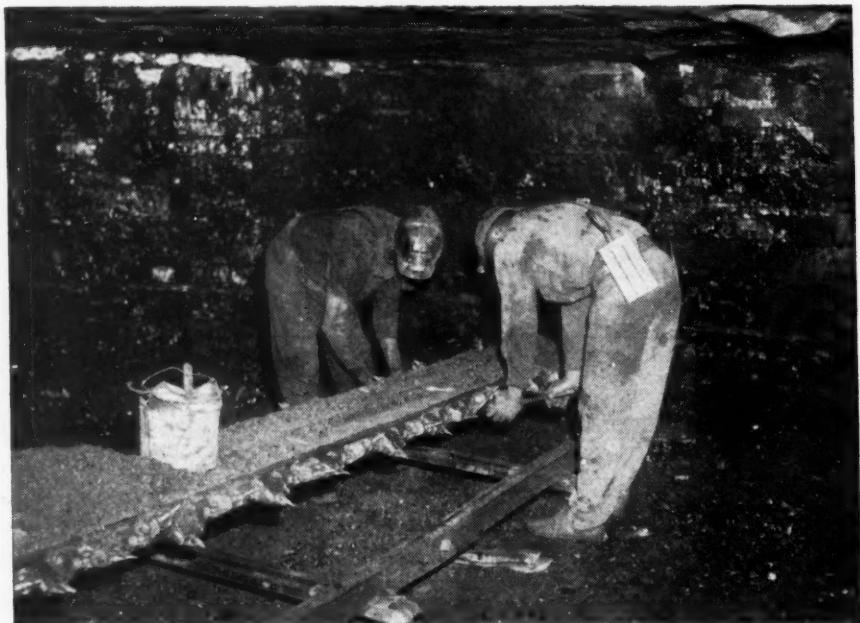


Fig. 2—A five-heading development plan in place of a four provides enough places for a development crew to load good tonnage.



The roof facilitates the loading of the drop-bottom cars. The conveyor boom crowds the coal against the roof and very little rolls over the edge of the car.



Hard cutting necessitates setting 16 to 18 bits to a place.

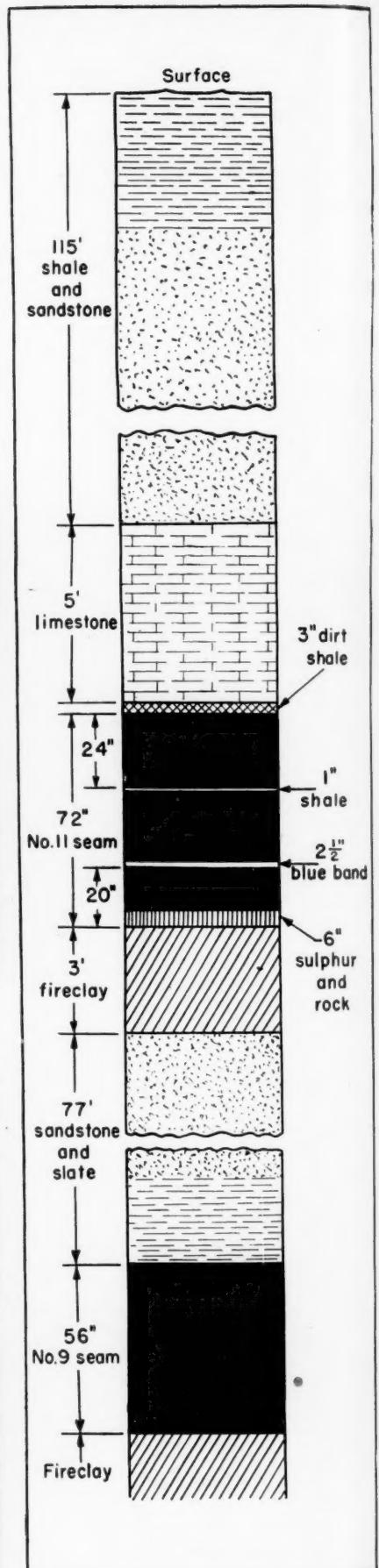


Fig. 3—Section showing both the No. 9 and No. 11 seams.

agement has proof that the measure is effective—the panel layout was modified slightly. On the inby panel entry, Rooms Nos. 6 and 12 are not necked from the entry but are picked up from Nos. 5 and 11. Where these are picked up, about 85 ft. from the panel entry, a crosscut is driven parallel to the entry through to the next room to boost coal recovery. This leaves two well-shaped pillars to protect the slender and pointed pillars between the regular roomnecks. On the other panel entry the roomnecks for Rooms Nos. 9 and 12 are skipped in like manner. Staggering the four pillars lends additional support to the territory every third room.

At least six roomnecks, besides the headings, are available as working places before a production crew moves into a 36-room territory. After a week's operation 18 places are available. Wherever a Goodman 324 AA track cutter cuts for a loader, the section crew consists of 18 men, namely: one loading-machine operator, one helper, one cutting-machine operator, one helper, one slacker, two drillers, one shotfirer, one bottom man, two gob men, three trackmen, two motormen and two tripriders. Where two short-walls cut for one loader, two more machine men and two additional gob men swell the size of the crew to 22. Under either setup, there is a section boss assigned to each crew.

#### Places Added for Development

Recently, the development plan was changed from a four-heading to a five-heading system to provide more places so that loader capacity would not be sacrificed on development work. It was felt that at least twelve working places were needed for a development territory. Even with twelve places, some of them must be cut twice during the shift to keep the loader in coal. In normal operation, a loader, according to Mr. Lanier, should load 85 to 90 8-ton cars per shift. With each fall providing 5 to 6 cars each loader would require 16 to 18 places a shift. The first cuts in roomnecks and crosscuts, since they are turned at 45 deg., make only about three cars per fall.

Norton likes servicing each loader with two 8-ton gathering locomotives. Each locomotive handles as many as four 8-ton cars and, with pick-up switches laid in each crosscut, car-changing time is reduced to a minimum. The list of gathering locomotives (built by Goodman, General Electric and Jeffrey) include four 8-ton units, a 5-tonner and a 6-tonner. All are equipped with General Electric

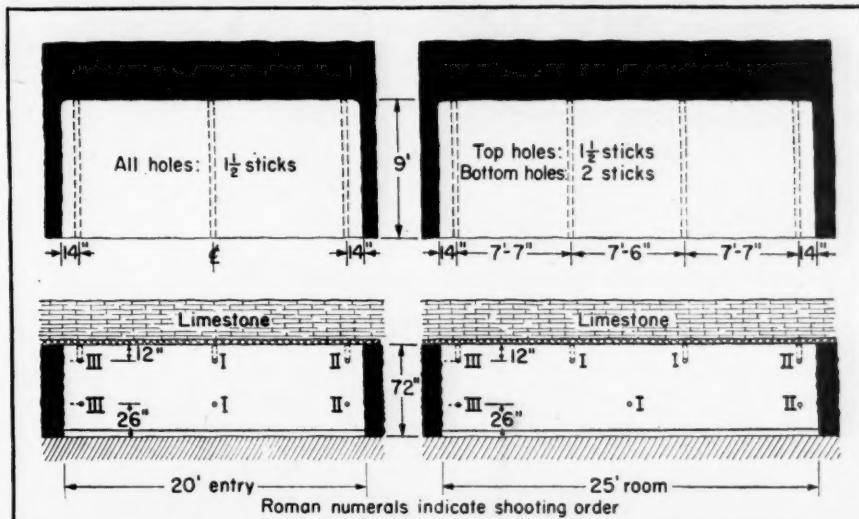


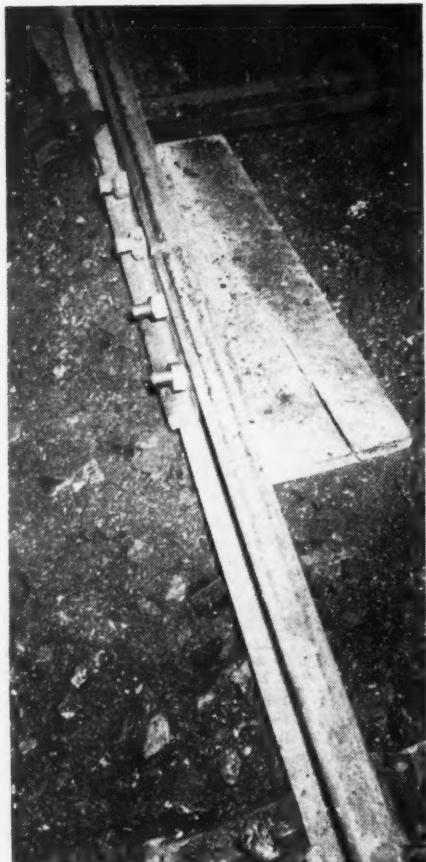
Fig. 4—Drilling and shooting plans for both wide and narrow work.



Drillers finish the last rib hole with a 9-ft. auger.



Track is laid to within 5 ft. of the face. Steel ties are spaced 30 in. apart.



A typical joint in the prefabricated track. One of the 13-ton main-line locomotives pulls its trip over the surge bin on the bottom.

## Norton Officials

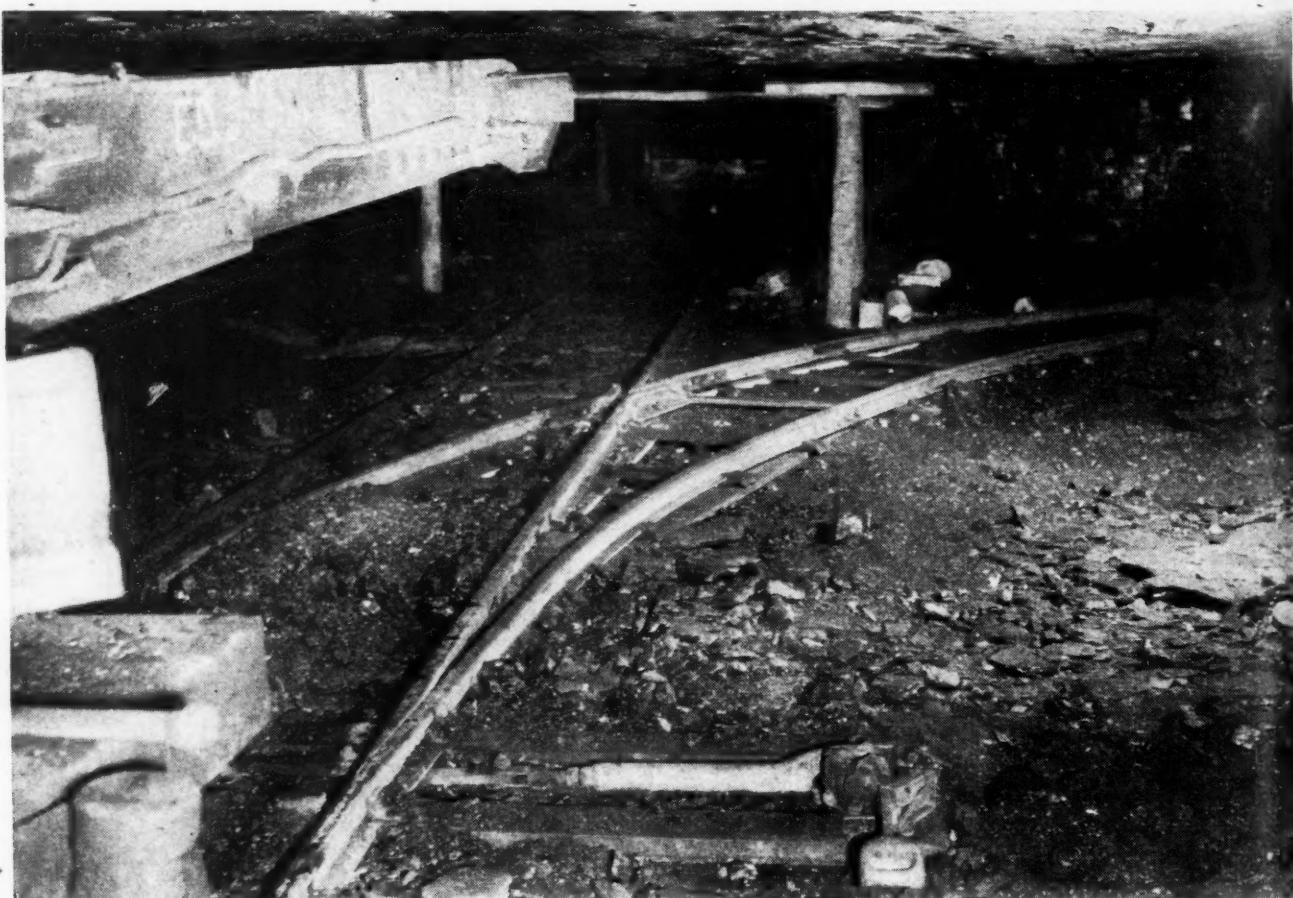
Sterling S. Lanier Jr., President and General Manager

Russell D. Lanier, Vice President in Charge  
of Sales

R. L. Schlotman, Assistant General Manager  
and Purchasing Agent  
J. R. Taylor, General Superintendent  
Lindsay Cobb, Assistant General Superintendent

Sterling S. Lanier III, Assistant General  
Superintendent in Charge of Preparation

Leo Fox, Chief Electrician  
Leamon Rector, Assistant Electrician  
Herbert Love, Mine Foreman  
R. I. Prouse, Tipple Foreman



One of the many pick-up switches used in the three-room key system. Boards are used to level the track.

flat-top reels and transfer switches.

The operation has 56 8-ton Sanford-Day drop-bottom cars with the improved door latch. All are equipped with Timken tapered roller bearings.

The 35-hp. standard and 50-hp. universal shortwall units are being replaced as fast as the Type 324 AA Goodman track cutters arrive. Despite the hard cutting, the management feels that after the crews are broken in one track cutter will cut enough coal for one loader. This will reduce the size of the section crews from 22 or 23 men to 18, exclusive of the foreman.

The drilling pattern for both the narrow and wide work is shown in Fig. 4. Chicago-Pneumatic No. 473 hand-held drills are standard equipment in all sections. Each hole is loaded with  $1\frac{1}{2}$  to 2  $1\frac{1}{4} \times 8$ -in. sticks of

du Pont Monobel AA permissible explosive and is fired with Atlas electric detonators with 8-ft. leads.

Three Goodman locomotives are used in main-line service: a 12- and a 13-ton unit for regular service and a 10-ton unit for general utility work. All haulage units are equipped with W. M. Hales Co.'s. Twinlite locomotive headlights.

Substations (totalling 700 kw.) with 150- and 200-kw. m.g. sets and rotary converters supply d.c. power to the mine. The d.c. network is divided into sections and only one substation supplies a given section.

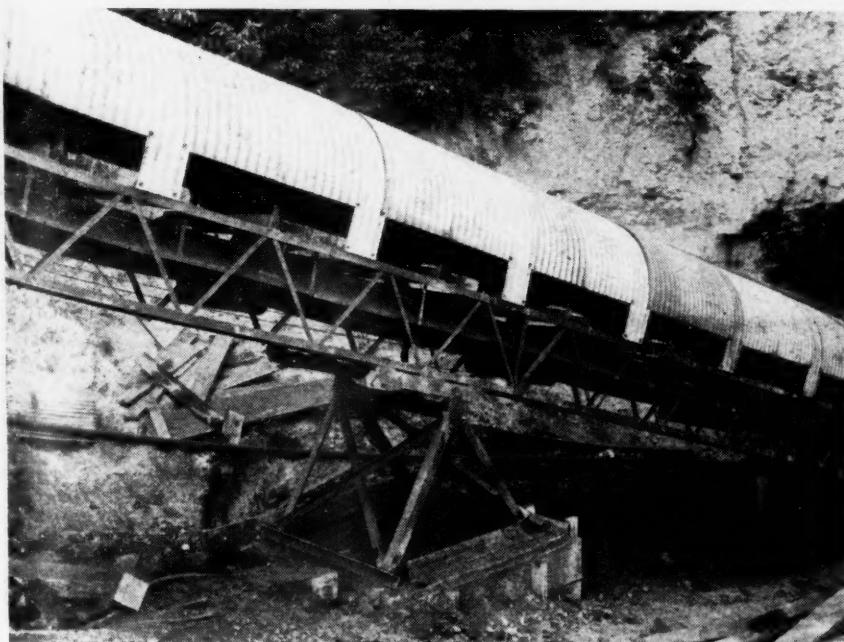
Coal moves from the 250-ton underground surge bin to the tipple and washery over a 356-ft.-long Barber-Greene conveyor equipped with a 5-ply Goodrich belt. A Montgomery wash

box washes the 3x0-in. and the minus 28-mesh is turned loose in a large settling basin. The foreign substances settle out quickly and the coal particles settle in a separate region of the basin. Much of this fine coal has been reclaimed from the basin by using a scraper loader. Skimming off the coal by layers, allowing some time for air drying in between the taking of the layers, has reduced the moisture content of the coal as loaded in the car from 17 percent to 6 percent. The ash content runs about 12 percent. All water from the No. 11 workings gravitates to a natural sump (a worked-out section of the No. 9 seam) and is later pumped through a  $\frac{1}{2}$ -mile-long 5-in. Transite pipe line to the washery.

Jones & Donan, surveyors (Madisonville) visit the mine twice weekly.



This concrete-block washhouse is a recent addition to the surface plant.



This 30-in. 356-ft.-long belt conveyor moves the coal from the surge bin to the tipple.



Sterling S. Lanier Jr. is president and general manager of the Norton Coal Co.



Lindsay Cobb is assistant general superintendent.

# ELECTRIC SHAKER

## Speeds Unloading of Railroad Cars

Two Minutes the Usual Time to Unload a Hopper-Bottom Car Using a Vibrating Shaker Let Down on Car Edges by a Hoist—Labor for Unloading Cut in Half at Carbon Fuel Storage and Barge Plant

TWO MEN instead of four is the labor saving that has been effected by The Carbon Fuel Co. in unloading hopper-bottom railroad cars at its river dock near Marmet, W. Va., by installing a motor-driven shaking device which is let down onto the top edges of the car being unloaded.

Carbon Fuel's Kanawha-River storage and barge-loading plant, described and illustrated in the September, 1939, issue of *Coal Age*, has yard space for stocking 140,000 tons and equipment to reclaim and load it into barges at a rate of 125 tons per hour. Loading coal into the barges directly from railroad cars as received from the company's mines, 23 miles distant, is done at a rate of 250 tons per hour. The barge-loading harbor is a dredged pool, with

its length at right angles to the river, and is equipped with three slips for barges with a maximum width of 30 ft. Byproduct and steam coal is handled over this terminal and most of it goes to the Belle works of du Pont across the river. Rope hoists are used for spotting railroad cars and barges.

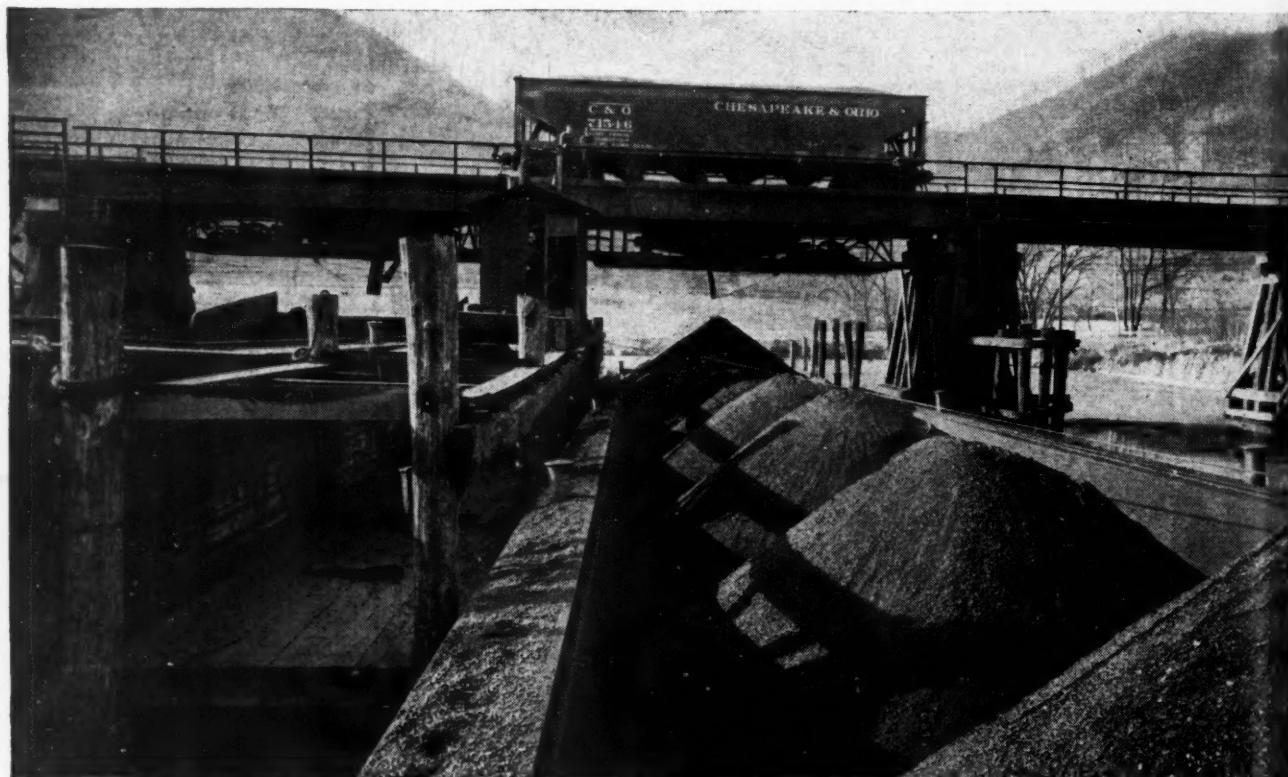
The car shaker is a recent development of Robins Conveyors, Inc. As shown in the illustrations, it consists of a motor-driven eccentric vibrator which spans the width of the railroad car and rests on the top edges of the car body. The motor is mounted on a frame supported on the vibrating unit by coil springs above and below.

During the spotting and dumping no men are required on top of the car. One man works on the floor on each

side. Their jobs consist of operating the pushbutton to spot the car, operating the control ropes to let the shaker down onto the car, opening the car doors and operating the pushbutton to start and stop the vibrator.

Two minutes is the usual shaking time to completely unload a car. That includes about 85 sec. required to shake out the last 5 percent, or dribble, which is retarded by the corners and rivets near the bottom of the car. Normally the coal is dry. The sizes are minus 2-, 1½- and ¾-in. and part of the tonnage is cleaned on air tables.

The railroad company sent test engineers to observe the operation, to measure the vibration in various parts of the car and to see if any loosening of rivets could be detected. Apparently



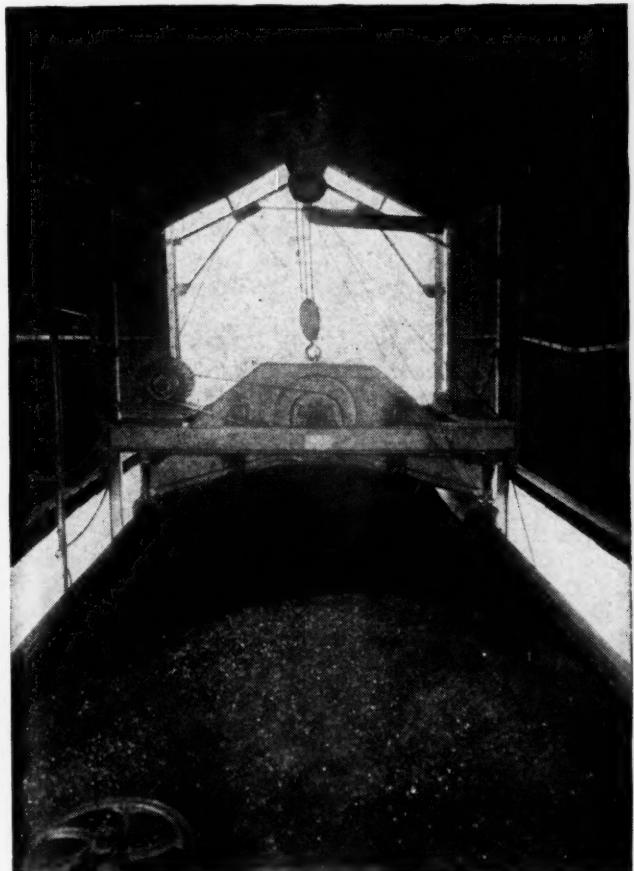
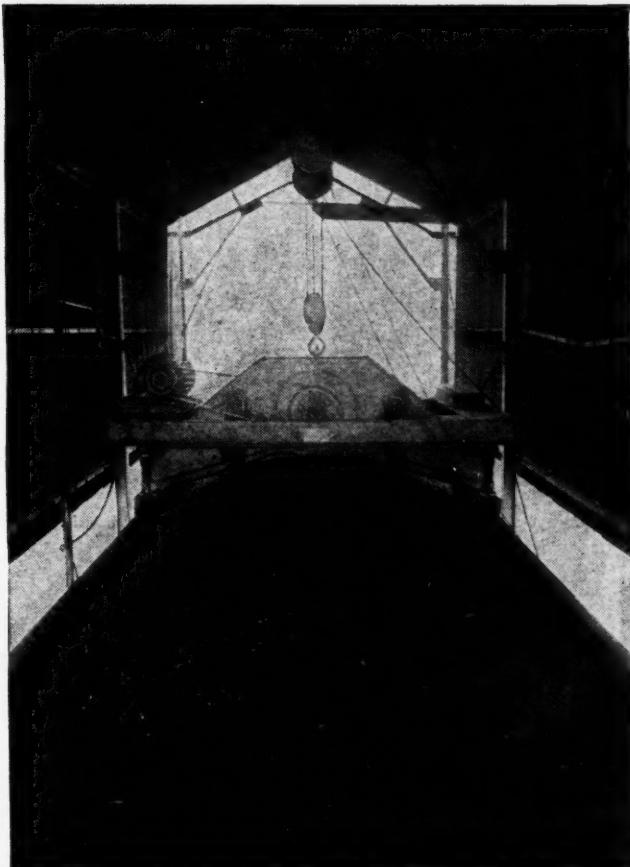
This illustration was made before the shaker-supporting shed was built over the car-dumping track. The partially loaded barge is at right angles to the river.

the shaker is no harder on cars than some of the improvised methods formerly used to poke or jar the coal loose.

Until the shaker was added, the dock had been operated without a shed over the car-dumping hopper. Because it was necessary to erect some type of overhead support for the shaker, and because overhead weather protection for the men had proved desirable, a shed was built. An I-beam is mounted inside, near the hip of the roof, to accommodate a trolley supporting the electric hoist. The shaker is suspended from this hoist. In operating position it is anchored loosely by chains hooked to the sides of the shed. The chains keep it from twisting out of the correct position, permitting its channel-iron side bases to hook over the car edges.

L. N. Thomas, Charleston, is president of The Carbon Fuel Co. and C. A. Pearce, formerly of the mining department of the company at Carbon, is superintendent of the river dock and storage.

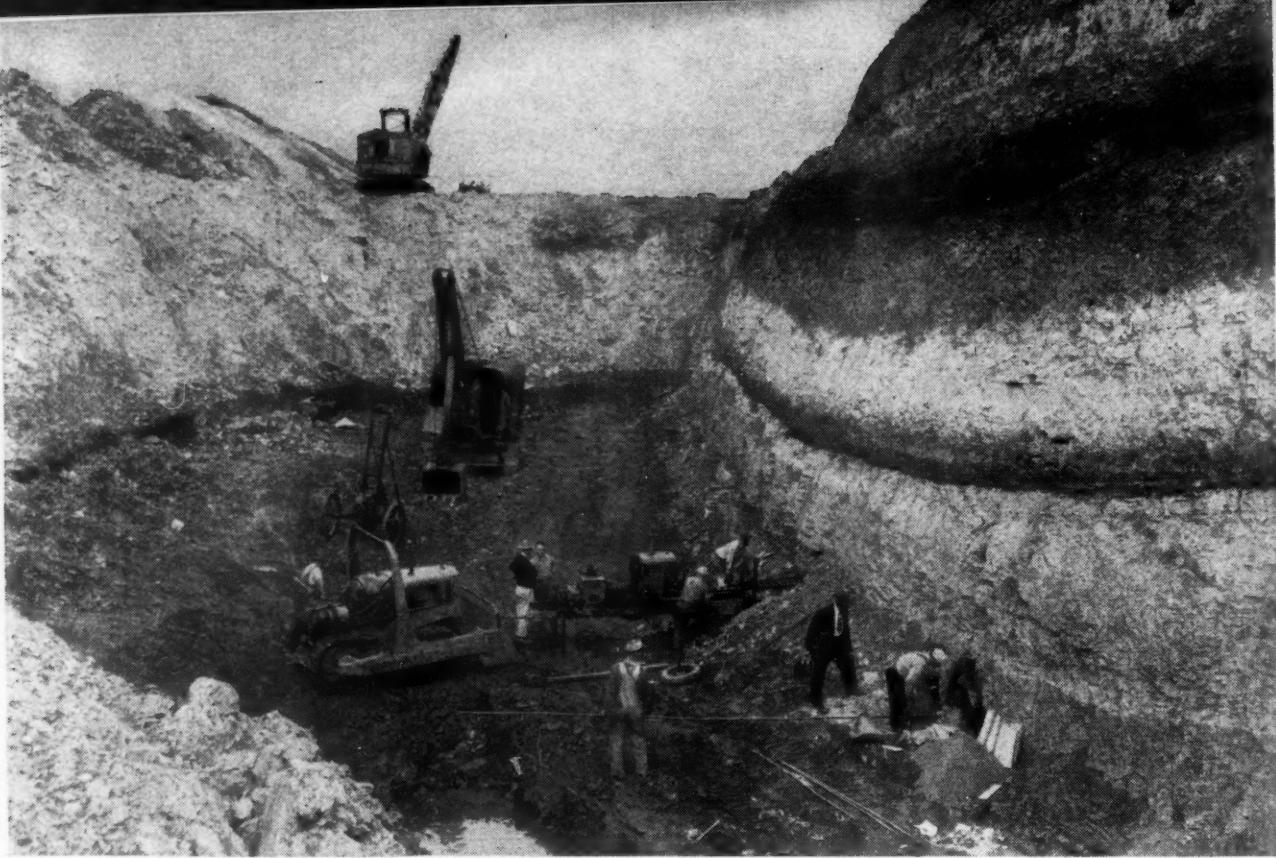
**Motor-driven shaker let down on the top edges of the hopper-bottom railroad car.**



Ten seconds after starting the shaker motor, the car is half unloaded. The car is spotted and the vibrator motor is controlled by pushbuttons operated from the floor.



Car completely emptied, including the dribble, in 1½ minutes. The shaker has been raised ready for another car to be spotted. Only two men are needed, one on each side of the car.



Looking toward the cut or working face. This, however, is not the end of the pit. A hole is being loaded in the foreground while the drilling crew works nearby. The loading shovel, in the pit next to the 18-ft. berm of coal, is equipped with a  $\frac{3}{4}$ -cu. yd. bucket.

## BUSSEY STRIP MINE

### Solves Its Problems by Unusual Methods

**Overburden 40 to 50 Ft. Thick Stripped by Draglines With Booms 55 to 75 Ft. Long—Bulldozers Bench for Draglines, Which Work Crosswise of the Pit—End-Dump Trucks Do No Backing at Tipple**

DIGGING successive crosscuts at right angles to the length of the main pit is the method used at Bussey mine of the Dunreath Coal Co., Bussey, Iowa, to strip 40 to 50 ft. of cover with draglines having booms only 55 to 75 ft. long. This mine, in Marion County and consisting of three pits, ships 1,200 to 1,300 tons per day when conditions are favorable and last summer seldom dropped below 900 tons. Dumping equipment at the tipple permits end-dumping trucks to discharge without backing, thus saving considerable time. An elevated picking table midway between the dump and tipple, and a small crusher bypass, are other unusual arrangements in the tipple construction.

The company is owned by a partnership of Edward, Owen, Joseph and M. B. McConville, of Centerville and Knoxville, and this is their first experience in strip mining. They formerly operated a deep mine near Centerville under the name of the McConville Coal Co. Ed Parsonage, Knoxville, Iowa, is general superintendent of this strip mine.

Two coal seams are mined, each about 5 ft. thick and separated by 20 ft. of tough sand rock. However, both are not mined in the same pit. Where the upper seam occurs, it only is taken because excavating to the other would involve a depth too great for the equipment. The lower seam is mined in some hollows where the upper is

not present. Because the deposits are spotty, pits, as a rule, are not over 1,500 ft. long.

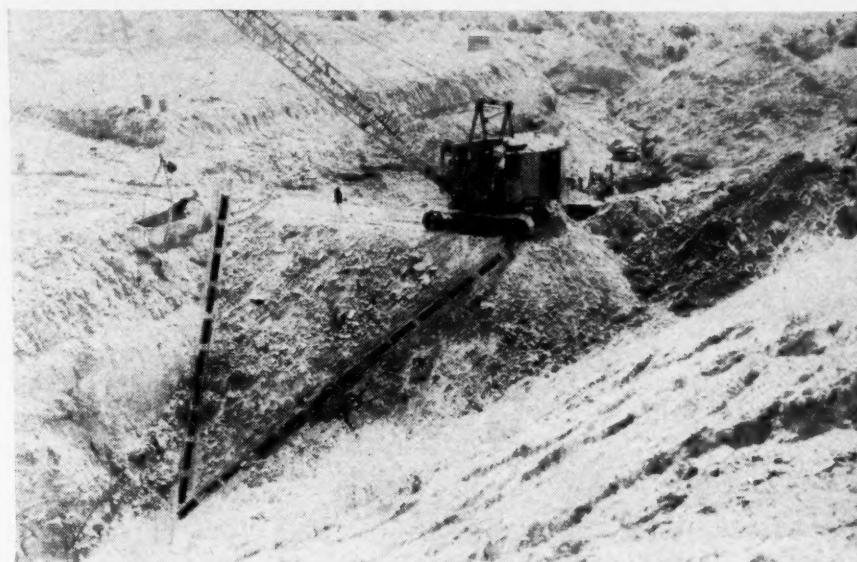
Three Northwest crawler-type draglines comprise the stripping equipment. Two, with  $1\frac{1}{2}$ -cu.yd. buckets, are Model 6 gasoline-driven outfits. One of these has a 55-ft. boom and the other a 60-ft. The third is a Model 85  $2\frac{1}{4}$ -cu.yd. unit with 75-ft. boom and is driven by a diesel engine. Coal loading is done with three Link-Belt crawler shovels. Two are Speeder units, one a B-3 with  $\frac{3}{4}$ -cu.yd. dipper and the other a B-4 with 1-cu.yd. dipper. The third is an LS40 fitted with a  $\frac{5}{8}$ -cu.yd. dipper. It was changed over from a dragline and has the new chain-type crowd which, at this mine, is considered far

Not the end of the pit at Bussey mine. The dragline, working on a bench 30 ft. above the coal, makes successive crosswise cuts, advancing the face 20 ft. each time. The spoil in the "V" is handled twice. When this illustration was made the dragline was cleaning a mud slide from the advance pit instead of its normal work of digging the cut on this side. Next to the high wall is the 18-ft. berm of coal left for the truck road.

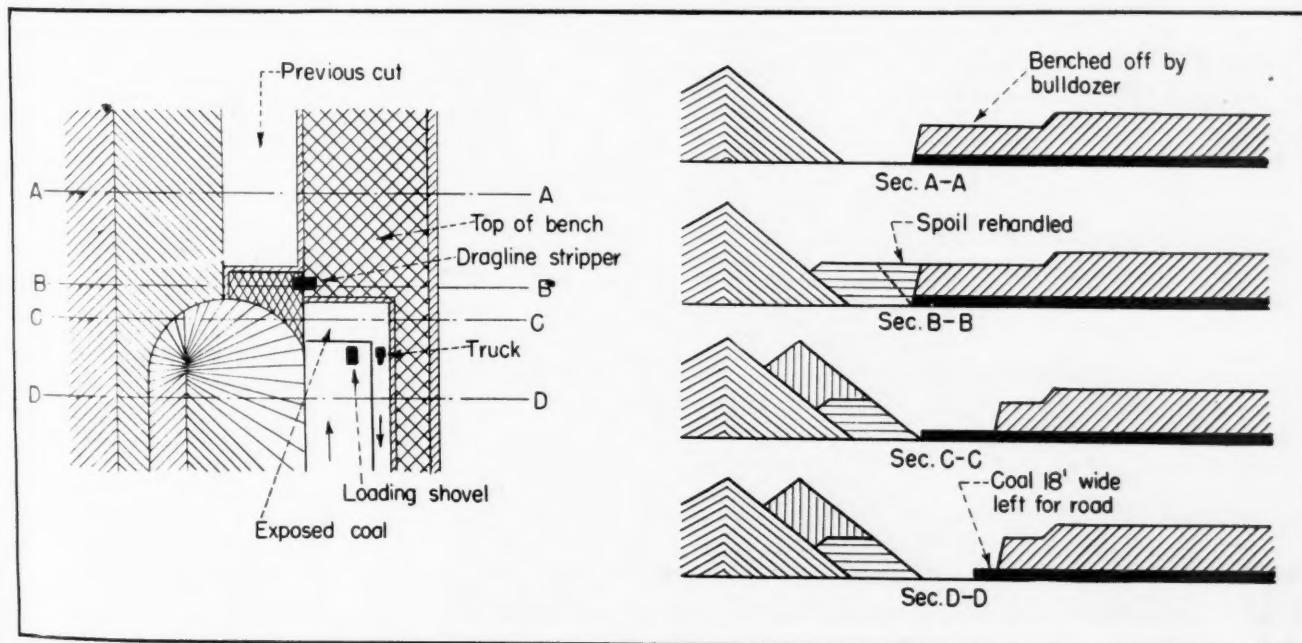
superior to the cable crowd used on the other two loading shovels.

Other pit equipment includes three tractors with bulldozers, two Hardsocg vertical coal drills, one Hardsocg horizontal overburden drill and three 4-in. portable pumps. The pumps and drills are gasoline driven. Two of the tractors are Allis-Chalmers WK units and one a Caterpillar D-7. One pump is a Jaeger and two are Carver solid-brass units with tungsten-carbide seal rings.

The stripping and loading shovel illustrations accompanying this article were made in Woodruff pit on an 80-acre lease two miles from the tipple. The terrain is rolling and a small creek cuts through the property. Where the stripper was working, the cover, totaling 40 ft., consists of 20 ft. of hard shale over the coal, 10 ft. of softer shale and 10 ft. of clay and top soil. Both the shales must be shot to be handled with the available equipment. All the pit haulage is on the coal, which is quite hard and is not damaged by the trucks or the cats of bulldozers. A berm of coal 18 ft. wide is



Looking back along the pit in the direction the coal is trucked out. The spoil in the "V" will be rehandled. Normally, the boom and bucket of the stripper would be pointed the other way. At this time, it was removing some mud from the advance empty pit.



Coal 18 ft. wide next to the high wall is left for a roadway until the successive stripping cuts and coal loadings reach the end of the pit. Then, the remaining bench of coal is loaded on the retreat. Following that, another strip cut is started.



This dam guides surface water to a culvert to which a flume is connected to carry water across the cut in the background.



Surface water crosses the truck haulway and pit through this 12-in. corrugated galvanized steel pipe.



This pit is around the contour of a gently sloping hillside. The pipe carrying surface water from a dam is 12 in. and made of corrugated steel. It discharges to a drainway maintained through the spoil. Three 4-in. gasoline-driven portable pumps are employed.



Plant for weighing, dumping, picking, crushing, screening and loading into railroad cars at Bussey mine. Coal is elevated only 25 ft. from the dump hopper feeder to the top of the tipple.

left next to the high wall the full length of the pit for this haulage.

The overburden, as a rule, is benched off to 30 ft. above the coal with a bulldozer and the dragline works along that bench. To start a new end cut, the dragline moves back onto the high wall and fills a short section of the advance pit to make a roadway 20 ft. advanced from the last cross-cut. Working back and forth on the cross roadway, which is about 60 ft. long, it excavates a new cut which bares an area of coal about 20x60 ft. A certain amount of the material next to the spoil is necessarily rehandled.

The loading shovel loads out 20x42 ft. of the coal, leaving 18 ft. next to the high wall to serve as the roadway. Progress along the pit is a repetition of these cuts.

Surface water is shunted from the pits by dams, ditches and steel flumes, the last mentioned being used where it is desired to carry the water across an open cut or broken ground. The usual flume is a 12-in. corrugated galvanized steel pipe with the sections connected by steel bands pulled together with clamping bolts at the top.

Four of the seven buckets and dippers which the company has in use or on hand were made by Page Engineering Co., Chicago, and three by the Mount, Williams & Drake Co., Omaha. In the welding and repair shop near the tipple the Omaha buckets have been fitted with renewable shanks and teeth made by the H. & L. Co., Huntington Park, Calif. A repair job on this equipment is described and illustrated on p. 112 of this issue.

For shooting the overburden, 6-in. horizontal holes are drilled in the hard shale 2 ft. above the coal on 20-ft. centers and are loaded with 200 to 250 lb. of du Pont 40-percent gelatin dynamite in 5x18-in. sticks. The charge is confined by 12 ft. of stemming. The coal is drilled with gasoline-powered vertical-auger machines and is shot



Crossover hopper for end-dumping trucks. When the driver starts across the dump he finds the path blocked by the sides of the hopper. If the tipple has been operating and there is no coal left on the plates, the driver starts a motor which slides the plates up out of the way.



Here the man at the left has his hand on the outgoing pushbutton by which a truck driver, reaching from his cab, lowers the hopper side plates to funnel the coal into the opening. This movable hopper keeps the coal off the truck tracks and also serves as storage space when the lower hopper is full.

with du Pont Agritol No. 2 in 1½x8-in. sticks. Holes for breaking coal are drilled on 6-ft. centers and three to five sticks are used per hole.

Bulldozers are used for handling and carrying barrels of gasoline, fuel oil, lubricating oil and other miscellaneous materials in and about the pits. They are adapted to this service by racks hooked temporarily onto the blades. Further description and an illustration of this useful device will be found on p. 108 of this issue.

Coal haulage from the loading shovels to the tipple is contracted to James Richey, who supervises the work himself and has his own garage in Bussey for truck maintenance. All are gasoline type, four are tandem drive and the loads range from 6 to 12 tons. Trucks are weighed near the dump at the tipple.

The steel tipple, moved from an abandoned mine and located on a joint track of the Burlington and Wabash lines, spans three loading tracks and has one apron-type boom. In contrast to the former common practice at railroad shipping mines in Iowa, this tipple does no loading into box cars. It is not so equipped and loads into open-top cars only. Markets are steam, railroad and domestic.

The tipple was put in a shallow cut. Thus, by making a road fill of 12 ft. at the truck-dump hopper the coal needs be elevated by conveyor only 25 ft. from the dump hopper feeder to the top of the tipple.

An unusual method is employed for dumping end-dumping trucks on the same plan as bottom-dump trucks—on a straight run without any backing. As a trucker starts to drive across the dump hopper, he stops to push a button on a post within reach of the cab. This starts a motor which slides the two side plates of the movable hopper up out of the way of the truck wheels. After the truck is driven forward to

proper dumping position, the driver reaches out from his cab and pushes another button, which causes the plates to drop back, forming sides to guide the coal into the center pocket, thus keeping it off of the wheel runways and forming an additional storage space if the lower hopper is full. The next driver again raises the plates providing, of course, that the tipple has taken the coal so the plates are clear. Small wire ropes pull the plates up but they return by gravity as the motor and hoist are reversed.

Midway between the dump hopper and tipple, the elevating apron conveyor is flattened for a short run to serve as a picking table. Refuse slides to a truck-loading chute from pockets on each side:

The mine-run conveyor delivers to a McNally-Pittsburg 48x48-in. single-roll crusher. From its discharge, the coal gravitates through a chute 4 ft. wide to the main screen, which is a 4x12-ft. Simplicity vibrator.

Another crusher, a smaller one made by the Hercules Mfg. Co. and installed to one side at the head end of the vibrator, makes 1½-in. coal for small stokers and at times is used to raise the percentage of 1½-in. in the industrial-stoker size. To divert a part of the crushed mine-run to this crusher, a plate is removed from a hole in one side of the chute ahead of the main screen. Bars across the opening support the plate and also serve to prevent pieces of coal thicker than 3 in. from entering.



On the left side of the chute leading from the mine-run crusher to the main vibrator is a hole which can be blocked or left open to shunt part of the flow to the smaller crusher at the left.

# MINE VENTILATION

## Improved by Proper Auxiliary Equipment

Air at the Working Face the Real Goal—Brattice Lines Are One Answer But Have Disadvantages—Auxiliary Ventilating Equipment Provides Positive Circulation and Reduces the Cost of Mine Air

By J. H. DICKERSON  
Mining Engineer  
Huntington, W. Va.

IN MINE ventilation, a main air current carries fresh air into a mine and removes air contaminated with mine gases and powder smoke and reduced in oxygen content on its return to the outside. Most miners work ahead of the crosscuts through which this air current moves. Very little, if any, air moves in the average working place unless supplementary means are provided to divert it from the main air current. State mining laws usually limit the distance between crosscuts to put fresh moving air closer to the miners. If, however, these crosscuts are driven at short intervals they retard entry driving, increase slate falls and other roof difficulties, add to the expense of building stoppings and increase leakage. Leakage makes ventilation difficult to maintain and results in higher power bills.

Progressive companies driving four or more headings usually provide temporary intake and return airways ahead of a line of permanent stoppings. Fig. 1 is an example. These permanent stoppings may be from 300 to

800 ft. apart and, up to the last of these, entries on one side are made all intakes and on the other side all returns. This reduces the number of stoppings and leakage but does not remove other objections to the numerous crosscuts that may be driven between the headings on either side of the line of stoppings.

In mechanized mining, crosscuts seldom will provide ample ventilation for more than two cuts ahead, yet the face may be more than 100 ft. ahead before another crosscut is completed and the main air current moved up by closing the crosscut last used, as the law provides. Four or more men may be working to complete a crosscut and get out several cuts a shift when there is nothing to move dust, gas, powder smoke and devitalized air. Men cannot produce efficiently in such an atmosphere. Work also is slowed down by dust-laden air which makes it difficult to see and increases the possibility of accidents. It is here that auxiliary ventilation becomes essential.

Line brattice is the best-known method of getting fresh air to working faces. It is used in very gaseous mines because it is considered the safest method, the men have become accustomed to it and a change might lead

to mistakes and serious results. In such mines the volume of air in the head of the main is fixed by the quantity of methane generated in the mine and must be sufficient to bring the percentage in the return air within the established limits of safety. These mines generally handle a large volume of air at a high water-gage and thus can stand more leakage in line brattice than mines where less air is needed. Air will leak through a line brattice but if there is sufficient left to clear the face, any gas moving forward is diluted along the side of the line brattice.

Line brattice is difficult to install properly and invariably leaks extensively. It seldom is effective for more than 50 yd. and there always is the possibility of its being torn down when it is supposed to be effective. Pressure from the roof or an accident may destroy all or much of its benefits. Recently, I found a door in a brattice line carelessly left open while the same airway was not getting sufficient air because another curtain had been pulled away from the top by a rock fall. Within a short time there would have been an explosive mixture. Sometimes brattice lines are disconnected to facilitate work and a serious explosion resulted from taking out a section when a conveyor was being moved. A brattice line may fail at night and needs constant supervision.

Curtains or doors are sometimes installed to permit men and equipment to pass through line brattice, but these are hard to keep closed and in order. Consequently, many operators prefer to make line brattice continuous and insist that men go around. A curtain in a crosscut where track is laid to the aircourse is preferable to two in lines of brattices. Brattice cloth is rather hard to handle in mines and it is difficult to keep lines within proper distance of the face. Taking it down and moving it to another place is difficult and expensive, particularly when such moves are frequent, as in rapidly advancing or retreating faces with me-

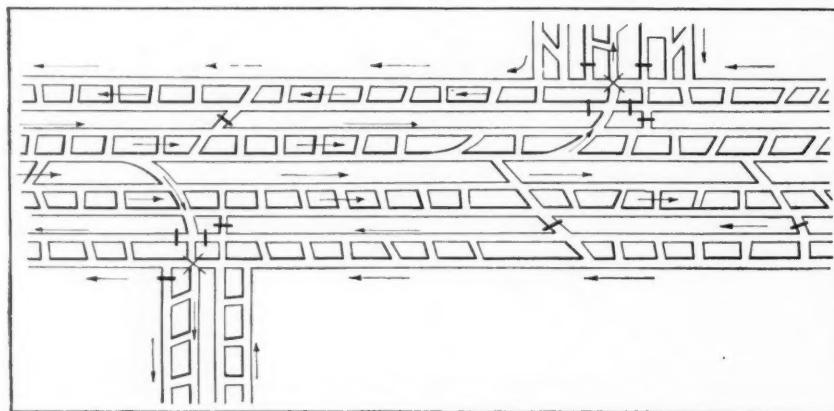


Fig. 1—How number of permanent stoppings is reduced by increasing crosscut distance and leaving long chain pillars in the center of the entry.

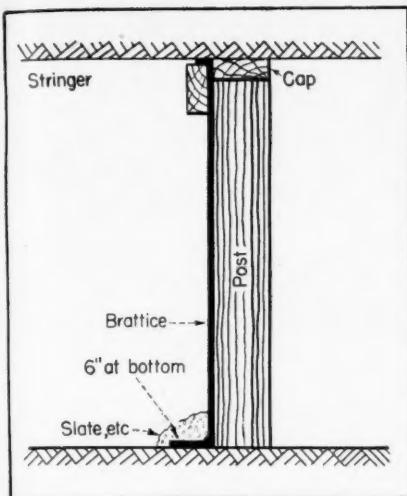


Fig. 2—An efficient method of installing line brattice.

chanical loading. Damage in service usually makes the life of brattice cloth short.

To secure a reasonably tight line brattice, the cloth should be at least 6 in. wider than the height of the seam, be suspended from a stringer between the posts and be sealed at the bottom, as indicated in Fig. 2. If the reduction in pressure is important, as in an open split, the posts should be on the outside of the narrower airway. In Fig. 3 they are shown on the inside of the brattice line in the intake airway. To put them on the outside and reduce friction, a flat steel bar or wood strip may be attached from top to bottom of the post over the brattice cloth.

For curtains through which locomotives operate, some companies have adopted a material used for powder bags. It is suspended in strips about 3 ft. wide. It turns up easily when a trip passes through it and drops back into place afterwards. Its first cost is high but it makes a tighter curtain, seems to stand the wear, has the additional advantage of greater safety since it will not hold water and carry an electric current, shifts aside easily and there is no danger of its wrapping around a motorman or triprider.

Compressed air, primarily for drills and coal-cutters, was once used to help relieve bad air at the face in coal and metal mines. However, it offered only a measure of relief and was of little value in places it was desired to push rapidly. It gave way to separate rigid pipe and this soon was followed by flexible tubing, which was a great improvement. At first, the tubing usually was laid on the floor or gob, where it was likely to be punctured and was subject to excessive wear and strong acids from moisture. The quality of the tubing has been continually im-

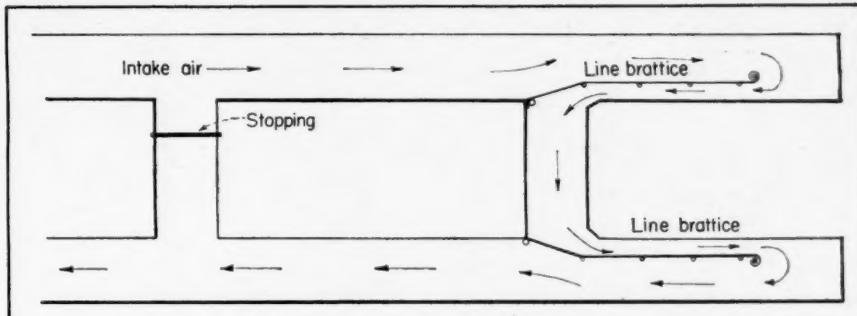


Fig. 3—How posts may be installed in placing line brattice.

proved to protect it against mine water and give it greater strength. With this and more improved methods in its use, the average life of tubing has been greatly increased.

In one large mine headings were kept down to a 9-ft. width. Even then, heavy steel beams have to be used on 4-ft. centers for good roof support. However, the top will stand long enough to work out wide rooms with mechanical loaders. To drive the headings wide enough to permit the use of line brattice would make the cost of mining this coal prohibitive. Consequently, blowers and tubing are used. The blowers are placed on platforms suspended from the roof and the tubing also is suspended (Fig. 4). Therefore, both are out of the way of mine cars and motors. This is an example of saving coal which could not be mined economically otherwise. In anthracite mines, pillars may be cracked so that they cannot be used to direct the air and it is difficult to seal around a chute that crosses over an airway to a track heading. For these and other reasons blowers and tubing are used extensively in anthracite mining. They also have many advantages in bituminous mining and are used in almost all headings in metal mining.

#### Outside Fan Relieved

Blowers and tubing will relieve the outside mine fan and some that have been overloaded may be adjusted for more air. Line brattice increases the resistance of a mine and reduces the volume of air that can be circulated at any given pressure. Blowers and tubing will deliver air a greater distance than line brattice. They reduce the volume of air and pressure which the outside fan must produce. In addition, where a smaller volume of air in the mine will give adequate air at the face, due to a reduction of leakage, power bills for ventilation, in addition to roof troubles and the like, are reduced, along with the tendency of the mine to become dangerously dry in one

season of the year and precipitate moisture in another.

The resistance of line brattice to the movement of air may be figured fairly closely theoretically. If a heading is 5 ft. high and 12 ft. wide, with a line brattice 3 ft. from the rib that could be made air tight, the velocity of the air behind the brattice would be four times that in the heading approaching the line brattice. On the other side of the brattice, it would be one and one-third that in the unobstructed airway. The pressure to move the air both ways along each 100 ft. of such a line brattice would be about as much as for 3,200 ft. of the 12-ft. heading. In practice, this would be reduced by leakage. However, with posts on the inside of this narrow airway, there would be increased resistance and there is a power loss each time air leaves line brattice and expands. In most cases, there is a pressure of more than  $\frac{1}{2}$  in. w.g. on an open split due to line brattices. This is added to the fan pressure needed for the main air current.

If blowers and tubing are substituted for line brattice, very little power will be consumed by the blowers and the air they move will help the outside fan. A reduction of  $\frac{1}{2}$ -in. w.g. in the fan pressure, by the removal of line brattice and use of blowers and tubing, will result in a larger equivalent orifice and there will be a larger volume of air moving at any given pressure.

If there was no leakage in a mine and the resistance was reduced from 3 to  $2\frac{1}{2}$  in. w.g. for the same volume of air, the saving in power required would be about 17 percent. However, we always have leakage and a reduction in pressure reduces leakage. Consequently, a smaller volume of air would be required at the fan for the same delivery at the face. This would reduce pressure further and increase power savings.

If the volume of air at the fan is 125,000 c.f.m. at a 3-in. w.g., with 75,000 c.f.m. at the last crosscuts where the air begins its return, and the water-gage is reduced  $\frac{1}{2}$  in. by the

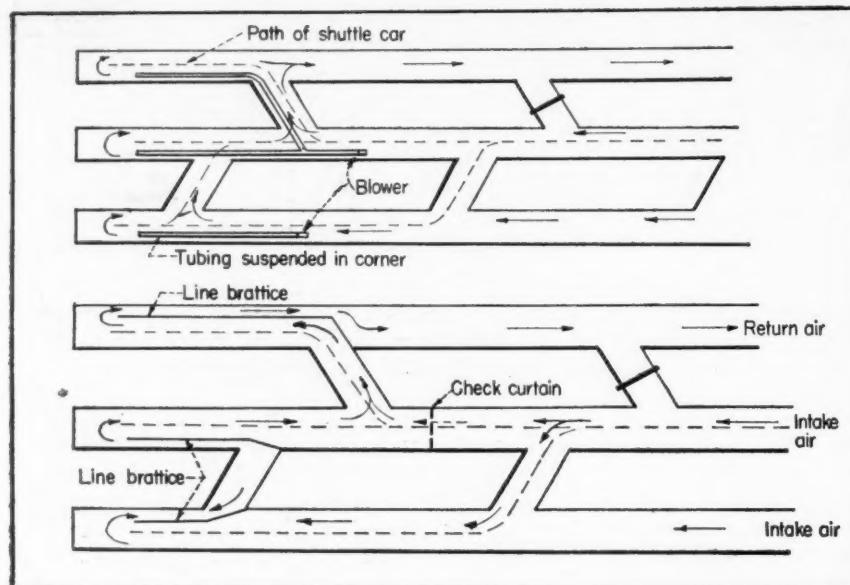


Fig. 4—Top—use of blowers and tubing in driving a three-heading entry. Height is sufficient to suspend tubing and keep heading width down to 9 ft. Each heading gets fresh air at the face regardless of operations in each. To use line brattice, the headings would have to be widened as in the lower view, a check curtain would have to be used in the middle heading and smoke and dust would be carried from one heading to the next.

removal of line brattice or other resistance near the face, the volume of air required at the fan would be reduced to about 120,000 c.f.m. to provide 75,000 c.f.m. in the working sections. The fan pressure would be about 2.3 in. w.g., making a saving in the cost of power for the outside fan of 26 percent. The power cost for a fan running continuously for a year at 125,000 c.f.m. and a 3-in. w.g., with a 60-percent-efficient fan, an allowance of 20 percent for drive and motor losses and power at 1½c. per kilowatt-hour, would be over \$11,500 annually. To save 26 percent of this expense, auxiliary fans and tubing should be considered for reducing the pressure at the outside fan. If the pressure was ½ in. higher in the open split than in the others, the saving would be due entirely to the change in that part of the mine. Other advantages of blowers and tubing may be found to justify their use in other parts of the mine.

If the volume of air at the fan and in the working sections of the mine were the same as in the preceding example but the pressure at the fan was 3½ in. w.g., a reduction of 1 in. in the face sections would decrease the air required at the fan to about 113,200 c.f.m. for 75,000 c.f.m. delivered to the working section, and the pressure at the fan would be reduced to about 2.05 in. w.g. This is worked out as follows: X squared is to 125,000 squared as 2.05 is to 2.5. X, therefore, is about 113,200 c.f.m. and 125,000 minus

113,200 equals 11,800 c.f.m., the reduction in leakage resulting from the reduced pressure. This may be checked by solving the following: X squared is to 50,000 squared as 2.05 is to 3.5. X, therefore, is about 38,300 c.f.m. and 50,000 minus 38,300 equals 11,700 c.f.m. reduction in leakage.

Several calculations may be required to get the proper volume and pressure in these equations, especially if this method has not been tried before. The factor for power required in the first instance would be 125,000 times 3.5, or 437,500, and the change would reduce it to 113,200 times 2.05, or 232,060. The percentage of the power in the reduced factor would be to the original as X in the equation 437,500 is to 232,060 as 100 percent is to X, or 53 percent, making the reduction 47 percent. The annual cost would be about \$13,500, of which about \$6,300 might be saved by the removal of 1-in.-w.g. resistance near the face. This is not an unusual possibility.

The blower may be set back out of the way or on a platform suspended from the roof and the tubing may be suspended from a corner in the roof where it is not so liable to damage. If injured, it may be repaired quickly and easily. Tubing serves as a pipe, providing a light, non-leaking, continuous path from main air current to working faces. Where flexible tubing is used, it may be withdrawn easily before shooting and then put back quickly. One man can carry 150 ft. of average-sized

tubing. Blowers and tubing are especially suited to driving rooms and entries with a minimum number of crosscuts, since they provide convenient, positive and economical ventilation of workings over much longer distances than any other auxiliary ventilation.

Any type of auxiliary ventilation should be checked at least twice a shift if even as little as 0.25 percent of methane has been found in the mine. Brattice lines are best known and understood because of their long continued use. They need attention to see that they are properly installed and that leakage is never excessive. Brattice may become ineffective at any time as a result of roof falls or other accidents, as well as by open doors or men passing through it carelessly. If disconnected at any time for repairs or to move machinery and the like, a competent person should be in charge to check the air and direct the closing of the brattice line. Electric wiring should be kept away from brattices, as it is often wet and might carry a current and cause a serious shock to anyone coming in contact with it.

#### Using Blowers and Tubing

Blowers and tubing should be easier to check and keep in repair than line brattice, but require equally careful supervision. The following should be given special attention:

1. Locate the blower properly in the intake airway, with sufficient air passing its intake, to avoid recirculation. Keep obstructions and inflammable materials away and keep it in continuous operation during a shift, except when a shot is being fired.
2. Keep the tubing suspended where it will be out of the way and not likely to be damaged by men or equipment and see that it is properly connected and kept in repair.

3. If there is a possibility of methane, the motor must be permissible, with approved wiring and ground for the frame. If it is stopped for five minutes or more, a competent person must check the air for methane and direct the starting of the motor.

The new Federal Mine Safety Code for Bituminous Coal Mines gives satisfactory rules for blowers and tubing and they should be strictly enforced. In addition to these, each company should have special rules for their installation and use, showing how they should be installed in their particular mines under different conditions and giving explicit rules for operation. It would be well to submit these to the Bureau of Mines, as there are some special conditions not covered by their general rules.

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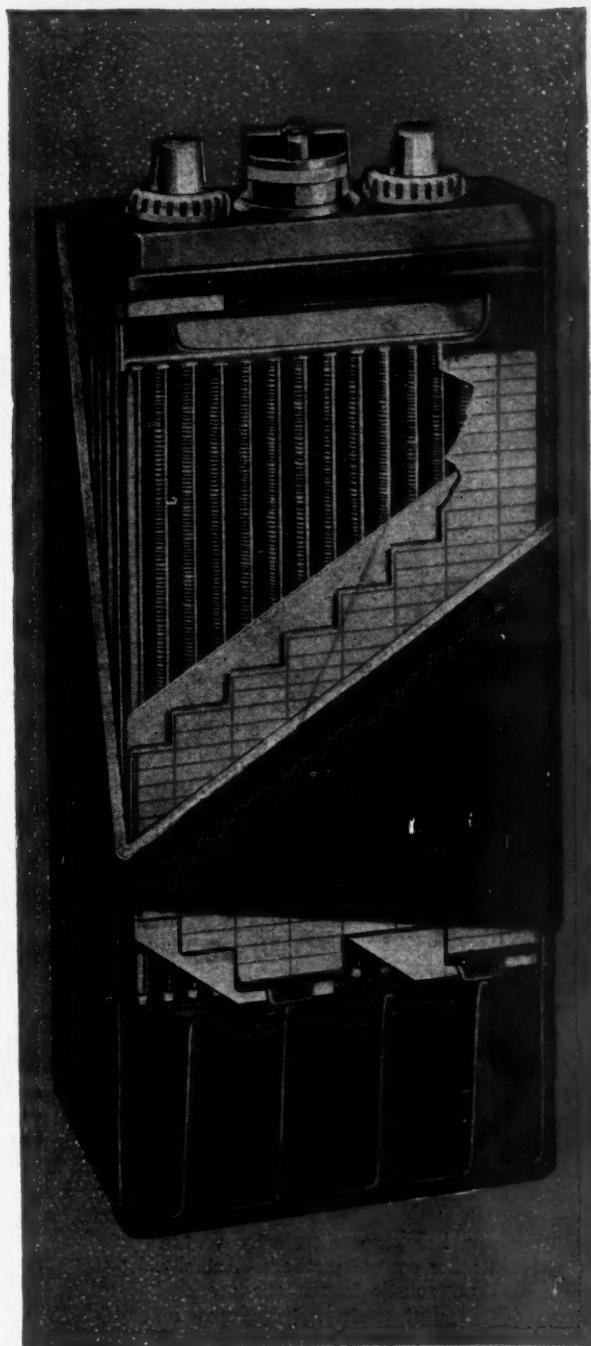
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# The Foremen's Forum

## Does Aluminum Guard the Lungs Against Silicosis and Tuberculosis?

RECENTLY, at many mines, not however, those engaged in the production of coal, powdered aluminum has been thrown into the air of change houses in regulated quantities to coat the lungs of men who have to work in the extension of places in siliceous rock, such as sandstones, gneiss and siliceous shales. This precaution is intended to protect them against silicosis (a chemical change in the lung resulting, it is said, from the action of soluble silica) and against the likelihood that when thus afflicted they will be exposed to tubercular infection and tuberculosis. The aluminum is dispersed before the men enter the change house, prior to the beginning of their shift. Many mines in the anthracite region and in the State of Washington have need of effective means of thus protecting employees engaged in rock-tunnel driving.

### Preventive Use

For Prevention of Tuberculosis—According to the Council on Pharmacy and Chemistry and the Council on Industrial Health of the American Medical Association, the use of metallic aluminum for prophylactic (preventional) purposes "might appear as an easy shortcut to healthful conditions, thus saving large expenditures for ventilation and other control methods. Actually, there is no substitute for the accepted methods of dust control. If industry indiscriminately treats all employees with aluminum dust, there may be an aggravation of tuberculosis and pulmonary conditions."

### Curative Use

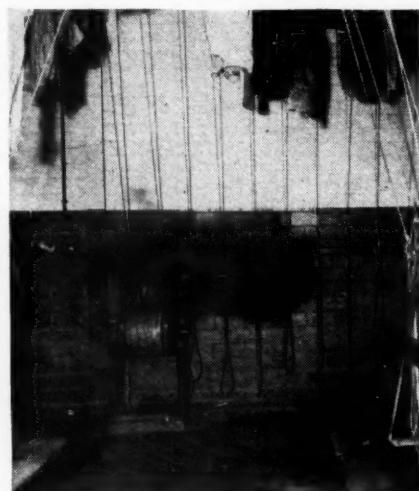
For Cure of Silicosis and Tuberculosis—"The therapeutic" (curative) "use of aluminum in man appears to relieve symptoms in a very small number of cases in which silicosis develops rapidly. Experience in some groups is more favorable than in others. In view of these" and other considerations, not here quoted, "it is recommended that the general application of aluminum therapy" (treatment) "in industry be delayed until adequately and impartially controlled clinical" (bedside) "observation demonstrates its effectiveness in preventing or alleviating silicosis in man. In the meantime, there should be no slackening in the control measures that have been found effective in reducing the incidence" (occurrence) "of dust diseases in industry." (Quoted from the Journal of the

American Medical Association, April 27, 1946.)

### Where Use Is Approved

Canadian Experience Favors Aluminum—In fairness, it should be stated that the method of preventing silicosis and its frequently attendant tuberculosis by the suspension of powdered aluminum has been found effective and desirable in Canada for the prevention of the occurrence of these diseases, but the claim is not made that silicosis or tuberculosis once developed can be cured or arrested by the use in suspensions of powdered aluminum.

In Canada, in metal mines, however, all the men employed are subject to silicosis, and accordingly the charge of aluminum is dispersed throughout the change periods. The protective treatment already is in use in 66 gold mines and seven base-metal mines and it is used, or is about to be put in use, in mines in the United States, Mexico, Chile, Peru and South Africa. Industries other than mining are proving the effectiveness of the treatment (see "The Know-How in Fighting Silicosis With Aluminum" by A. W. Jacob, *Engineering and Mining Journal*, March, 1946 p. 70).



Blowing aluminum dust into a change house. A small room partitioned from the main change house, and much less dust than is shown in the illustration, would suffice for the few men, if any, needing protection against siliceous dusts at a coal mine.

## Using One's Head To Detect Loose Rock

Testing of the roof by sounding and by noting the vibration of the hand or a rod always involves some danger, (1) because some rock is "following stone," to use a British expression, that falls almost as soon as the coal is moved from under it, and (2) because the man making the test has to place himself under the rock and then deliberately jar it to make it vibrate, so perhaps those who rap the rock and use the bony structure of the head to detect the vibration and evaluate it do not thereby add measurably to the risk.

Skull Close to Nervous System—If the head is held against the roof to transmit the vibration, (1) the rock can be struck less violently and still be effective because the vibration can more readily be detected by the skull than by the hand, the skull being much more sensitive because closer in touch with the nervous system; (2) the descent of the rock to the head, should the rock get loose and begin to fall, may be stopped by the upward pressure of the head, and the rock's retaining powers may be kept from deteriorating from the rapping, and (3) the descent of the rock to the head will be nil and thus free from momentum.

Audiphones for assisting in hearing are not strapped to the wrist and certainly not to the palm of the hand, where the callouses and fat separate the bone from the surface. The hand that holds the rod or pick handle to receive its vibrations does not amplify them. The audiphone is strapped to the bony structure of the head near the ear, and it makes a good sensitometer. Using the bony structure of the head to sense the vibrations of the rock above, one is using the dome of the cranium, which is so shaped as to accept vibrations and magnify them and so located as to be near the sensory organs.

If a piece of metal or of wood is jabbed against the roof or placed against it and struck by a hammer or other object, the head of the man making such a test may be some inches or even feet below, and when the rock falls there may be not only pressure but momentum. The energy of the rock falling to the skull will be  $mV^2$  (mass multiplied by square of velocity) in both cases but in one instance  $V$  will be almost zero and in the other case quite appreciable.

Used in Peoria and Central Pennsylvania—So, after all, "using one's head" as a makeshift vibration detector may be a justifiable method of detecting weakness in the mine roof. Some have placed a rod between the teeth to ascertain whether the

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struck roof vibrates like a drum or merely transmits the blow it receives to the mass of rock above it. Thus the teeth and the jaw serve as vibratory organs. The holding of the head against the rock being tested has been used in the thinner beds of the bituminous mines of Pennsylvania and in the Peoria district of Illinois, as also perhaps in other places. In thicker seams, the roof cannot be reached without standing on a car, and the method of test becomes inconvenient or impracticable, and in thick coal a rod or stick must be used. In the Centerville district of Iowa, a rod with a ball of 2½-in. diameter is used for testing roof.

## Why Await Hard Frost? Set Things Right Now

With winter approaching, thought should be given to the mining problems that it inevitably involves. After winter has arrived, and the ground is once more frozen hard, many jobs that now are readily performed may become extremely difficult and expensive.

Shaft, slope and drift sides and the roofs over slopes and drifts that allow water to enter should be sealed tightly against such seepage. Water accumulations and drains for the first 1,000 ft. or more from the ventilation intake should be well covered. The road water is warm and dirty, but, where it meets incoming air, it may become so cold as to freeze, and then will back up escaping water, which thus kept from running away, in its turn, may also freeze.

### Drainage and Shorting

**Pumps, Pipes, Drains and Switches—** Surface pumps should be substantially housed and a stove provided to keep them from freezing. Pumps in the intake air, if stationed near the portal, also may need some warming provision. All water pipes at the surface should be deeply sunk in the ground. In many parts of the northern tier of coal States, 4 ft. of cover is none too much. Drains dug around the shaft and drift to divert water and keep it from entering the mine should be cleaned and properly graded. Underground track switch turnouts on the air intake also should be carefully drained, so that they will not freeze. Surface switches also should be well protected by drainage.

### Care of Electric Equipment

Provisions should be made for heating electric locomotive sheds, because in the winter the idle locomotives will get cold, and being taken into the warmer moist air of the mine, may get covered with sweat or even frost which will short-circuit the controls, until the locomotive becomes warmed by its own electric resistance.

Any low points in the surface tracks should be brought up to grade, for that cannot be done easily and satisfactorily when the road is frozen, and water may collect and freeze in such places, derailing cars and locomotives. Dirt around and between the rails should be removed before

frost makes its removal difficult. The sides of all surface cuts should be properly sloped, so that material will not fall on the tracks and freeze in place. Take the railroads as a guide; they always align, grade and clean their tracks before winter arrives.

### Rock Dust for Winter

**Mines in Winter Often Dry as Tinder—** Though care should be taken throughout the year to keep the mine well rock-dusted; in the winter even more care should be bestowed on this matter, because during the summer the mine gets damp and the coal dust is often moist, whereas in the winter the mine is dry, and fine coal dust becomes loose and ready to be raised as a cloud by passing cars, the dislodgment of timbers, a shot, a short circuit or an explosion.

Most mine explosions occur in the late winter after the mines have had time to dry out. With summer air conditioning, the mine roadways are always likely to be dry, but in all stages of the winter, especially the last, may be in a suitable condition for a violent explosion. Particularly is this true in the intake, in a normally dry roadway and near the surface. Winter lubrication also requires a change in lubricants.

### Narcolepsy as Cause of Accident

Some people especially those engaged in noisy, laborious, hot, monotonous and repetitive jobs, go sound asleep on the job. At that moment they may be standing, working or sitting. Sydney Ingham, safety director, Springfield Armory, Springfield, Mass., writing to *Engineering for Safety* declares that a man who worked on the forge stated in a safety meeting: "That was my accident. Now I am going to tell you something that may seem screwy but, so help me, this is what happened. It was about two in the morning.

"I had been working about as usual. I took a bar from the furnace and turned to the hammer. The next thing I know, I had burned my knee. Now here is the screwy part. Between the time I took the bar away from the furnace, and the time I burned my knee with it, I had painted my house. I must have been asleep and dreaming." There was a chorus of supporters of his statement, who declared "That's right"; "It has happened to me"; "I nearly got killed that way"; "One time I . . ." This disease is known as "narcolepsy", stupor or dream seizure. "Narco," stupor, we are acquainted with already in "narcotic" and "lepsy", seizure, is familiar to us in "epilepsy".

The coal industry should be careful to see it has no narcoleptics on its locomotives, its hoists or indeed any of its machines. Many a man who has had all the sleep he needs will suddenly doze off with or without warning, possibly as the effect of digestion in stomach or ileum or as the result of narcolepsy. Men sometimes fall asleep writing even a short word. They are not sleepy but narcoleptic and hardly can be trusted to drive an

automobile or handle any equipment that threatens the lives and limbs of others.

Gang bosses, foremen, fellow workers or helpers in the forge room sometimes waken such men, who are advised to take a walk to the toilet or bubbler or go out on the platform for a smoke so that they can "snap out of it." The darkness of the mine, and the oxygen depletion may all have a part in creating narcolepsy. That disease may explain many mysterious accidents.

## Can't Account For Tastes

For years, we have said that natural air and all the gases in it were tasteless. Now we learn that oxygen tastes "sweet, sour and a little prickly", and of that no less than Prof. J. B. Haldane is the authority. That fact is one of Britain's after-the-war releases. Oxygen can be tasted only when it is pure, unmixed with air, or under a pressure of six atmospheres (88 lb. per square inch). Only when it is compressed can its taste be noted, and then only after it has been breathed for one whole perilous minute. But in 5 or 10 min. the man breathing such an atmosphere will have fits, so submitting to such a pressure is dangerous.

Yandell Henderson has said that carbon monoxide has a faint garlicky taste at normal pressures, but one is not likely to detect it. For many years it has been thought that methane had a sweet taste. Perhaps the ability to recognize these faint tastes depends on the ability of the taste buds of the individual to detect them, as well as on the concentration of the gases.

## Barometer Aids When Explosion Occurs

After a mine explosion mine officials have so many duties to perform that one hesitates to add more. However, one of these is to read the barometer promptly and during the "recovery" of men still living. If the barometer is high at the time of the explosion, a fall in the pressure may be expected, and the air in entries not traversed by the explosion will expand. Then the excess air in them, due to that expansion, must escape. It may not be able to travel toward the surface by the entry in which the explosion traveled because it will be met by air which enters from the outside to fill the so-called "vacuum," which the cooling of the air in that zone creates. However, in that event, it can travel oppositely toward the seat of the explosion where it will feed fewer fires than outside air.

It should be noted that the air in the roadways and airways, not directly affected by the explosion, is polluted for a short distance by afterdamp that enters after the explosion. If, due to the expansion of the air back of that zone, this foul air is driven out into the heading from which it received its afterdamp, the miners will be able to come out or can be brought out unscathed.

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# State-Board Questions

## Mine Foremen—Ohio

### Carbon Monoxide

**Q.**—What is carbon monoxide (CO)?

**A.**—A colorless, almost odorless, tasteless, combustible and poisonous gas. Even in such concentrations as may be breathed safely, it has a slight garlic odor (see Yandell Henderson and H. W. Haggards in "Noxious Gases"). Perhaps the gas has a real odor when in poisonous concentrations. In the mine, the gas is usually accompanied by fumes from heated coal, which fumes, during and after a mine fire, are designated "gob-stink."

Though found together, gob-stink and carbon monoxide are not of the same nature or similarly generated. Gob-stink arises from coal distillation, whereas carbon monoxide is formed in the mine from the incomplete combustion of the coal. The gas also is found after coal-mine explosions, and for much the same reason—namely that the methane and coal dust have been incompletely burned.

Carbon monoxide may be formed under other conditions, but always from the incomplete combustion of carbon or carbon compounds, and that because not enough oxygen is present to complete that combustion. Full combustion forms carbon dioxide which has twice as much oxygen as carbon monoxide and is represented by the symbol  $\text{CO}_2$  instead CO, the symbol for carbon monoxide. With more oxygen, carbon monoxide burns with a pale blue flame to carbon dioxide. It is termed carbon monoxide, because it has only one atom of oxygen for every atom of carbon, the word "monoxide", being derived from monos, the Greek word for "one."

The expression "dioxide" is derived from the Greek *dis*, meaning twice. "Oxide" is a shortened form for "oxygen acid." "Monoxide" similarly means "single-oxygen acid", whereas "dioxide" means two-oxygen acid. Carbon monoxide, or that gas and the fumes or gases that accompany it, used to be known as "whitedamp." Now that we know what carbon monoxide is, the old name "whitedamp" is less frequently used. It is, at best, an undesirable name, because with enough carbon monoxide present to kill anyone who breathes it, there may be also a quantity of methane also present, justifying one in terming the mixture "firedamp", rather than "whitedamp."

### Deprives Body of Oxygen

**Q.**—How does carbon monoxide injure life?

**A.**—The blood contains hemoglobin, the purpose of which is to combine with

oxygen in the lungs, to form oxyhemoglobin. When the blood circulates, it takes this oxygen to the tissues of the body and so supplies oxygen for their use. This oxygen it gives up to the tissues very readily in return for the carbon dioxide previously held in the tissue cells. If the body does not get the oxygen that it needs from the hemoglobin, it cannot function and accordingly dies.

However, when carbon monoxide also enters the lungs, the hemoglobin of the blood has such a partiality for it that it forms a compound with it, more readily than with oxygen. This worthless compound is thus presented instead of oxygen to the tissues, and the tissues cannot use it. When the blood returns to the lungs, they cannot remove the carbon monoxide, and that gas, accordingly, goes back at the next breath with the hemoglobin to the tissues, for it is not easily broken down into its component parts.

At the same second breath, more hemoglobin combines with carbon monoxide, and thus more of this worthless compound accompanies the blood in its trip to the tissues. After a few breaths, if there is enough carbon monoxide, the blood has too little oxygen to offer to the body tissues, and death ensues. If enough carbon monoxide is present in the air, the effect is immediate, but if there is less carbon monoxide, discomfort, nausea and headache precede death.

### Chemistry of Breathing

**That Most Obstinate Fellow-Traveller—** The accompanying illustration may aid in a clearer understanding of the action of carbon monoxide on the human body. This gas "picks" the tissues and keeps away the oxygen that otherwise would keep them alive and, with them, therefore, the body of which they are a part. In the lungs, carbon monoxide energetically and almost permanently mates with the hemoglobin of the blood to form "carboxyhemoglobin," which compound then passes to the tissues and returns to the heart and lungs wholly unchanged. It is then recirculated with more of the same useless material which is formed when, with the next breath, more carbon monoxide enters the lungs with the air.

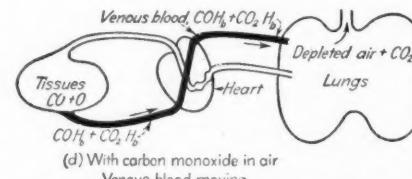
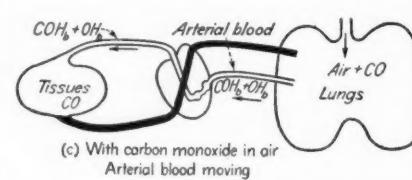
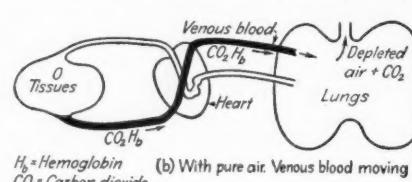
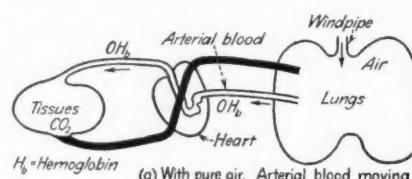
Oxygen, on the other hand, which in the lungs, only loosely mates with the hemoglobin of the blood, is seized for combustion in the tissues as soon as it reaches them. The hemoglobin then loads up quite loosely with carbon dioxide and takes it back to the heart and lungs. From the latter, it is promptly forced out, leaving the hemoglobin free to take up another load of oxygen at the next breath.

Thus carbon monoxide is a passenger in the blood that can be evicted only with great difficulty and so stays in its seat in the hemoglobin of the blood traveling back and forth almost interminably, whereas oxygen is an out-passenger traveling only to the tissues, while carbon dioxide is the passenger found always occupying oxygen's seat on the return trip to the lungs. On reaching the organs, the carbon dioxide steps down, and enters the air. Carbon monoxide seems not only to cause suffocation, (1) by stopping the supply of oxygen and (2) preventing the removal of carbon dioxide, but also to be a veritable poison, because it causes nausea and headache, usual symptoms with poisoning and not symptoms of suffocation.

### Low-Voltage Troubles

**Q.**—What is the effect upon motors of a drop in voltage?

**A.—(1) Insufficient Voltage—** When



Illustrated are: (a) transfer of oxygen to tissues; (b) transfer carbon dioxide to air; and (c) and (d) shuttling of carbon monoxide back and forth between lungs and tissues with concurrent decreased transfer of oxygen to tissues and carbon dioxide to air.

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the voltage of the current delivered to a motor is too low for its design and for the duty required of it, more current may have to be used to do a given quantity of work, and this will heat the motor excessively. The power of a direct-current motor is equal to the product of current and voltage, but the heat generated by the motor is proportional to the square of the current, so it is highly important to use as little current as possible in cutting, drilling, conveying, hauling and other work.

**Losses in Heat, Efficiency, Output and Outages**—All motors convert some of the electrical energy they receive into heat. Work cannot be done without such conversion but, the motor should not heat excessively. If it does, it is a sign either that too much work is demanded of it or that the power of the motor is being used mainly for heating the motor instead of being used mainly in keeping the motor up to its desired speed.

In operating a cutting machine, the proper speed will give the bits of that machine such a velocity of travel past the face being cut to chip off the coal rapidly. When operating the conveyors on a loading machine, due speed will give the conveyors suitable ability to transport and lift the product that is being removed from the mine floor and carried to the mine car. In the operation of conveyors, for transportation of the product, it will assure the necessary capacity and lifting ability to move the product at the required speed and up the gradients that the movement of the coal may encounter in its travel.

When operating a locomotive, undue loss of power, in merely heating the motor excessively, will mean that the power sufficient to bring the trips to the dump in scheduled time is being used instead to destroy the motor and to involve the shop in needless troubles and costs, and to subject operation to excessive outages.

#### Power to Revolve Armature

**Loss of Torque**—With low voltage, there also will be a loss of ability to go on revolving the armature when any physical resistance to operation is encountered. This ability to revolve the motor is known as "torque." The motor of a cutting machine when hampered by loss of turning force will be unable to cut a hard piece of pyrite or other impurity. Moreover a motor with too low a voltage, when operating a loading machine, will be less able to lift a large block of coal or move one which stalls on the sides of the conveyor trough. With a locomotive, lack of torque means stalling on hills or having to reduce the number of cars in the trip.

With insufficient voltage, every piece of electrical equipment tends to slow down or stall entirely. Troubles in the shop, failure to fill production quotas, discontent among employees, and all-around slowdowns result from low voltage.

(2) **Abnormal Heating and Frequent Burnouts**—Every motor heats when running, but with low voltage and the higher current that has to be provided to obtain the needed service, the heat is so severe that the solder melts and no longer holds the leads in place, the insulation is "cooked" and so deteriorates that the arma-

ture fails and windings have to be replaced.

Therefore, make up your mind whether you are trying to get work done or merely to warm the working place. If the latter, cheaper and more efficient equipment than motors is on the market.

#### Permissible Explosives

Q.—What will make permissible explosives deteriorate?

A.—(1) Moisture, (2) excessive heat. All explosives deteriorate with the passage of time, so explosives storehouses should be constructed and maintained with that fact in mind. Explosives should be issued to shotfirers, miners and others in the same order in which they are received, so that no explosives will be allowed to remain in storage long enough to deteriorate.

Two of the other disadvantages of using deteriorated explosives is loss of effectiveness and the waste of time while miners wait to be assured that the cartridges, which appear to have misfired, cannot and will not detonate later and thus imperil employees.

#### Danger in Deterioration

The dangers accompanying misfires are: (1) the necessity of drilling of new holes near the old holes with a possibility of the end of the drill entering into the original holes and detonating their charges while so doing; (2) the slow burning of the charges in the borehole with emission of volumes of poisonous gas and with ignition of coal; (3) the possibility of a blowing out of the still burning cartridges from the shothole into fallen coal; and (4) the ejection, when the shot is fired, of one or more unburned cartridges and unexploded detonators from the shothole. Such ejected cartridges may fall into the coal in front of the face, where they may injure workmen who have to load the coal, or where they may be transported to the preparation plant or to the market where they may injure the men engaged in such transportation or where the consumer may throw them into the furnace fire with coal and thus not only injure himself but the furnace also and even the house. These are matters to be given due consideration when deciding on methods that will prevent such deterioration.

#### How Cartridges Get Damp

Therefore, it is necessary to protect the cartridges against moisture and heat. Even a small crack in the roof of a magazine may result in the dampening of a few cartridges which, if used as primers, may cause a misfire. A dilapidated magazine, or one with a floor close to the ground, may have the same effect. Moisture may crawl up through the walls from damp ground and moisten explosives. Do not think permissible explosives need less care than dynamite. They need more care, for the ammonium nitrate they embody is quite receptive of moisture.

To keep the magazine dry, it should be well ventilated, and the air entering should not make its approach where it may become charged with water particles. Thus the gable ends of the magazine are preferable points of entry. Any unventilated

building, as is well-known, is likely to become damp. Blasting caps and fuse also need such protection. If the walls have cement mortar, that mortar should have no more than 25 percent lime. The floor, except in front of the door, should be set back from brick walls so as to permit the needed ventilation, and the explosives boxes should be positioned away from the walls for the same reason and also to prevent damp walls from communicating their dampness to the explosives.

#### Heat Rays Age Explosives

Too much heat from the direct rays of the sun beating on the magazine will make the explosive hard and indisposed to detonate, especially when the days are sunny and the nights cold. A steel magazine in places where the sun is likely to be hot should have a wooden roof above it, supported on posts so that the air can circulate freely between it and the magazine, although a coat of aluminum paint on a steel magazine may reflect so much of the heat that the explosives will not be injuriously affected. Steel magazines should not be used, however, where a carload or more explosive has to be stored.

### Pennsylvania, First Grade Foremen

Q.—Would you consider a mine efficiently ventilated when a large volume of air is found entering and leaving the mine? Explain.

A.—I would not consider a mine efficiently ventilated (1) unless enough air enters to give every man sufficient air to meet the legal requirements under the law, or (2) unless the air is so split that no more men will be present on any one split than the law allows or the mine inspector permits, or (3) unless the percentage of methane in any room nowhere exceeds 2 percent or in the return of each split no more than 1 percent, or (4) unless the airways are numerous enough, large enough, and so proportioned to the volume of air to be passed that the speed of air travel shall not be excessive, or (5) unless the individual pillars throughout the mine are not more than 105 ft. long or wide and measure no less than 48 ft. in either direction or (6) unless the stoppings and overcasts are so tightly constructed that air will not pass through them.

#### STATE OF PENNSYLVANIA LEGAL VENTILATION REQUIREMENTS

150 cu.ft. per minute per person in non-gassy mines.

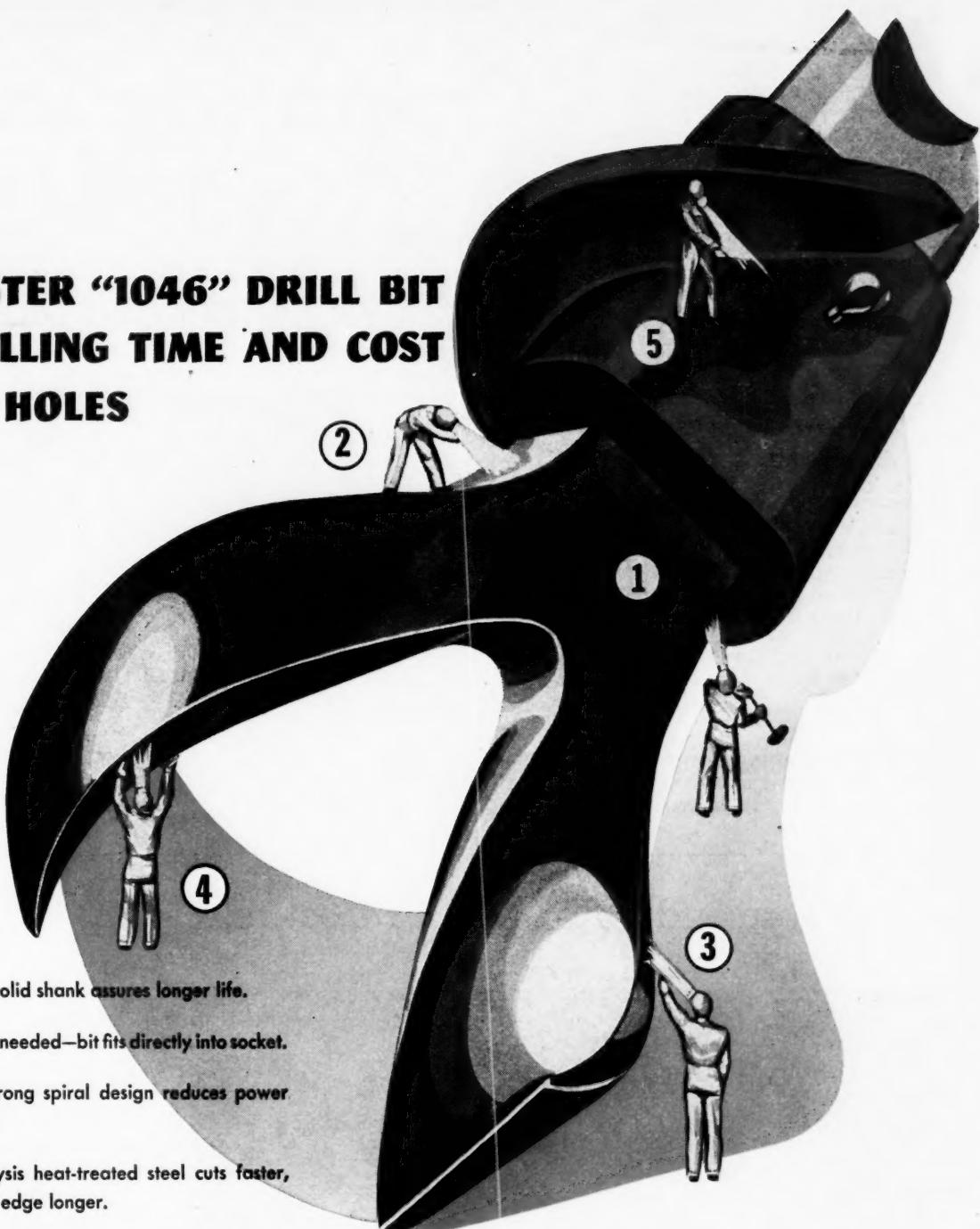
200 cu.ft. per minute per person in gassy mines and in each case as much more as the mine inspector shall deem requisite.

No more than 70 persons in one continuous split, though if the inspector permits, no more than 90 persons in such a split.

No more than 105 ft. between crosscuts and no less than 48 ft.

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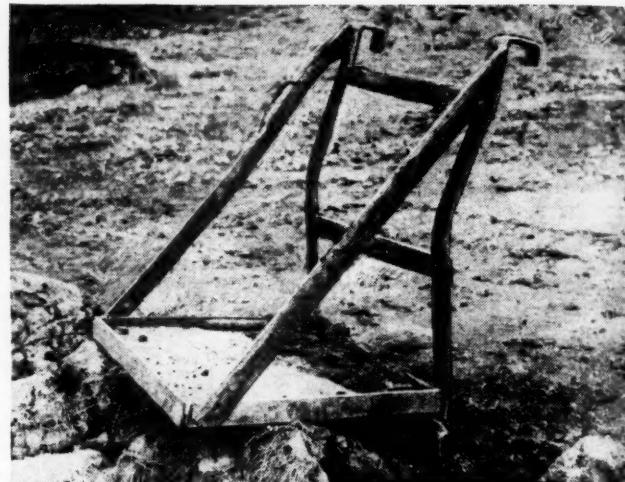
# Operating Ideas

## Bulldozer Rack Facilitates Pit Supply and Maintenance

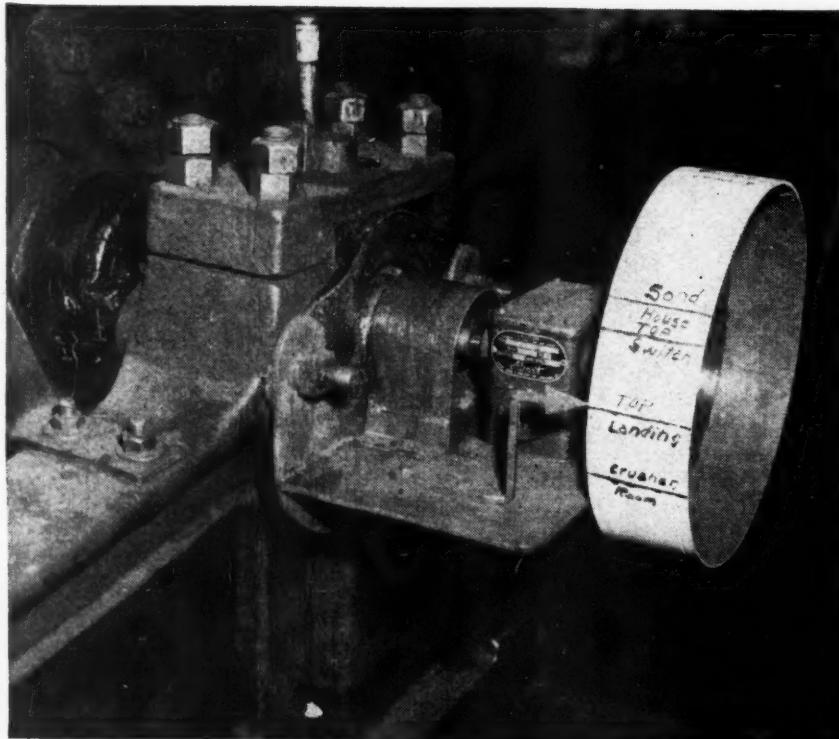
SUCH THINGS AS moving a 4-in. centrifugal pump, carrying barrels of oil and handling miscellaneous materials and supplies are now done quicker, with less effort and in a safer manner, at Bussey strip mine of the Dunreath Coal Co., Bussey, Iowa, since the mechanics built special carrying racks to hook over the blades of bulldozers.

The rack shown is large enough for a 4-in. pit pump and is convenient for carrying one 52-gal. drum of oil. Loading onto the rack is made easy by lowering the bulldozer blade to bring the platform to ground level. Raising the blade brings the platform practically to the level of the bed of a motor truck.

Hooked over the blade of a bulldozer, this rack comes in handy in hoisting and carrying pumps, oil drums and miscellaneous parts and materials.



## Drum Indicator Low in Cost and Easy to Install



On this type of indicator, the pointer is stationary and the markings rotate.

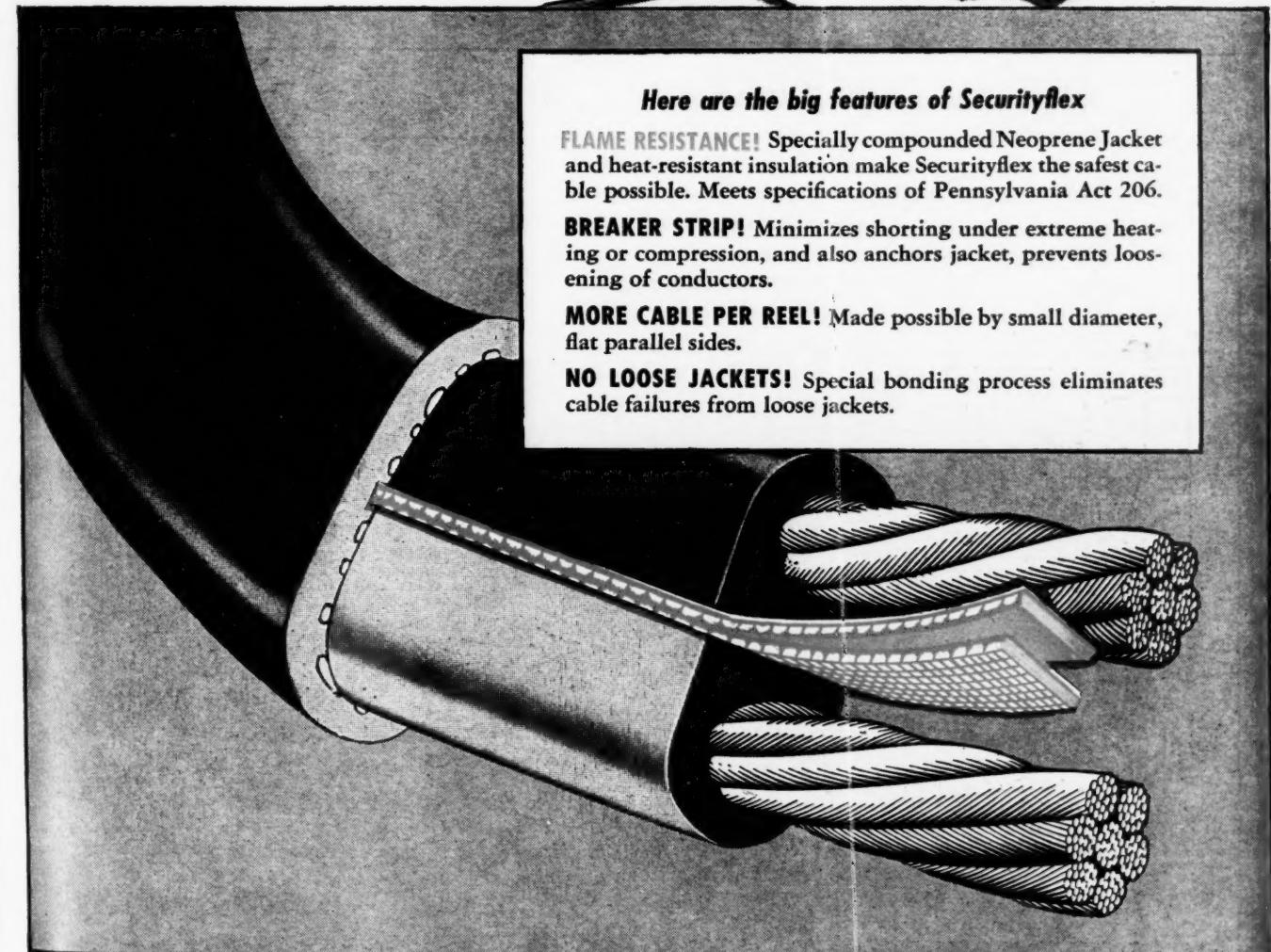
INSTEAD of a dial indicator, a wheel or pulley unit with markings on the face appealed to mechanics of a mine in Fayette County, West Virginia. Consequently, they made it and added it to the hoist handling men and materials on a 2,200-ft. incline on the mountainside from the railroad tipple to the level of the headhouse and main portal.

The listing of a small, inexpensive reduction gear of correct ratio to reduce from drum speed to convenient speed for a wheel-type indicator was found in a manufacturer's catalog. It was purchased and the input side connected directly to the end of the drum shaft of the hoist, while the indicator wheel was mounted on the output shaft. This reducer, made by the Albert Gear & Machine Co., Chicago, has the following data on the nameplate: "Type 150 DW, Ratio 200-1, Rated Hp. 0.033, Input Speed 1,800."

The wheel, which was made in the mine shop, consists of a hub with set screw, a sheet-metal disk 12 in. in diameter and a sheet-metal face 3 in. wide. The set screw in the hub makes it easy to adjust the indicator when a new rope is applied. All but 2 in. of the circumference is used in the full travel of the hoist. In the illustration the line marked "Sand House" indicates the extreme bottom and the one just below it marked "Top Switch" indicates the extreme top.

# Avoid Lost Tonnage Breakdowns

For maximum production at minimum cost, keep mining machines in continuous operation. Use cable that stands up on the job . . . and delivers adequate power. Anaconda Securityflex\* is engineered to provide safe, convenient, long, economical service. Consult Anaconda engineers on how to utilize it in solving your cable problems. Anaconda Wire & Cable Company, Subsidiary of Anaconda Copper Mining Company, 25 Broadway, New York 4, N. Y. Sales Offices in Principal Cities.



## Here are the big features of Securityflex

**FLAME RESISTANCE!** Specially compounded Neoprene Jacket and heat-resistant insulation make Securityflex the safest cable possible. Meets specifications of Pennsylvania Act 206.

**BREAKER STRIP!** Minimizes shorting under extreme heating or compression, and also anchors jacket, prevents loosening of conductors.

**MORE CABLE PER REEL!** Made possible by small diameter, flat parallel sides.

**NO LOOSE JACKETS!** Special bonding process eliminates cable failures from loose jackets.

**ANACONDA** *Securityflex* \***CABLE**

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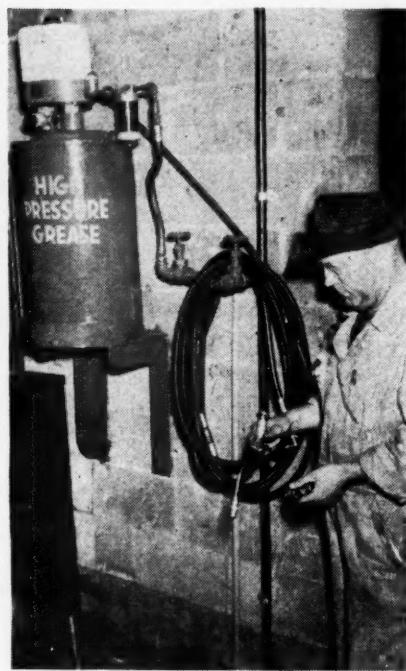
## Shop Gets New Greasing Unit

HIGH PRESSURE lubricating equipment, matching that used in the best of filling stations, has been installed in the surface shop at Piney Fork No. 1 mine of The Jefferson Coal Co. (Hanna Coal Co. affiliate) near St. Clairsville, Ohio.

The Aro automotive and industrial lubricating unit, shown in the accompanying illustration, is located in one corner of the shop and is equipped with a 60-ft. length of hose. The unit operates on a pressure of 110 lb. per square inch. Both new and repaired equipment is greased with it before they are sent into the mine.

Inside the mine, the lubrication of the cutting and loading machines is done by a high-pressure grease car and a two-man crew which visits each machine twice every 24 hours. The car is operated on all three shifts. Since it has been in service (April, 1944), only two anti-friction bearings have been lost. Maintenance costs are lower and mechanical breakdowns are occurring less frequently.

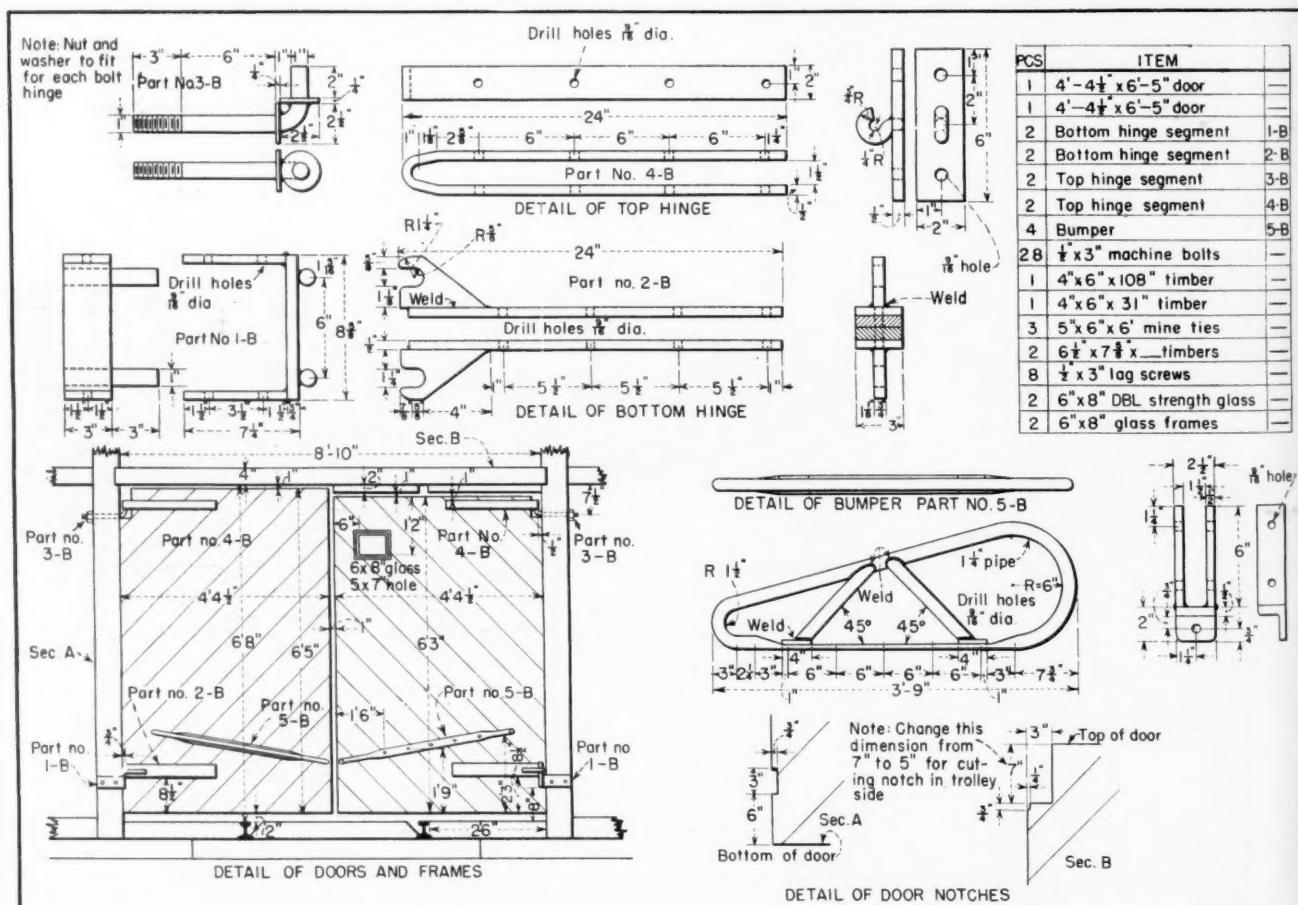
**Evan Adams, master mechanic at Piney Fork No. 1 mine, poses with the new grease gun.**



## Credit for Your Ideas?

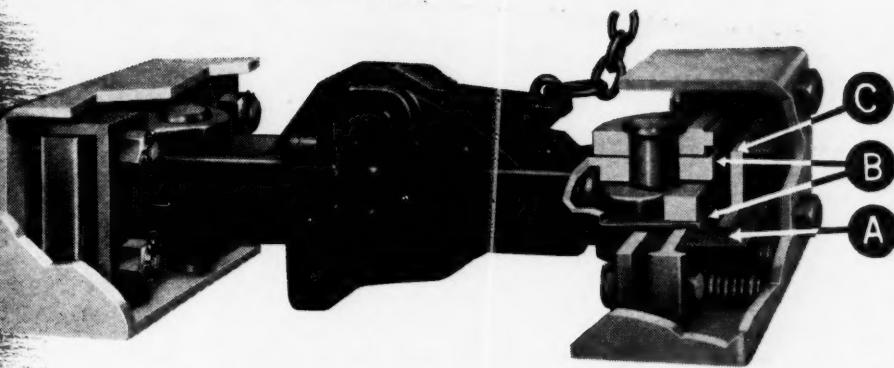
The mining "kinks" appearing on these pages are designed to help you and other operating men do the jobs described more quickly and easily and at lower cost. But while you may have used some of these ideas to an advantage, are you using this department to gain full credit and recognition for your own ideas? Send us any worthwhile mechanical, electrical, operating or safety idea that has worked for you. There's cash in it for you too. If published, Coal Age will pay you \$5 or more for each.

## Door Design Assures Improved Service



DEVELOPED from an eastern idea by E. O. Jackson, general mine foreman, this door design has resulted in very satisfactory service at the Kenilworth mine of the Independent Coal & Coke Co. Calls for prints by other mining men are further evidence of the merits of the design. Designated by mine officials as the "Type B self-closing mine door," it is featured by an improved design of hinges and other parts.

YOU CAN GIVE  
YOUR MINE CARS  
ADDED TRACK STABILITY



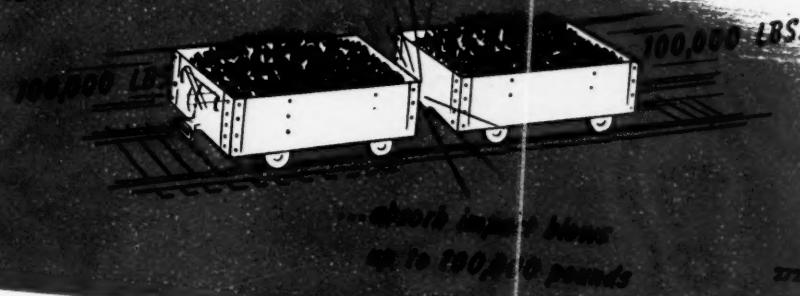
Sectioned view of a new Form-8 Coupler. Up to 3000 lbs. push, the coupler is free to pivot around the clevis pin, the thickened ends of the rubber buffering pad (A) absorbing the compression. Above 3000 lbs. push, the coupler draw-bar ends (B) bear against the steel plate (C) embedded in and vulcanized to the draft gear. The stabilizing pressure thus produced pushes the couplers, and hence the cars, into alignment.

Specify O-B AUTOMATIC COUPLERS designed  
specifically to meet mine operating conditions

*Ohio Brass*

MANSFIELD, OHIO

Canadian Ohio Brass Co., Ltd., Niagara Falls, Ontario



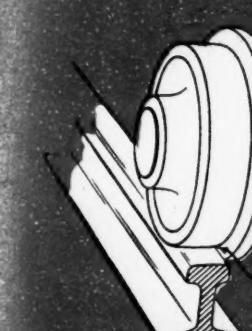
...lessen wheel flange wear

No scrubbing  
action here

...prevent buckling  
under push or buff



...keep mine cars in  
center-to-center alignment



## Renewable Press-Locked Teeth Improve Drag Buckets

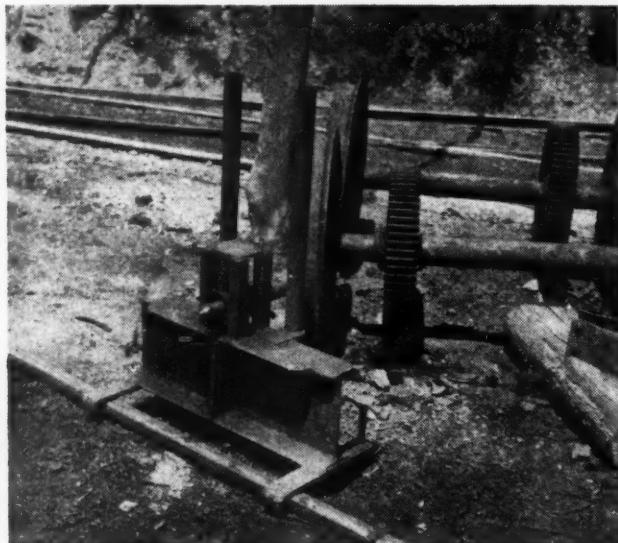
FOR GOOD RESULTS in reducing maintenance, the dragline buckets at Bussey strip mine of the Dunreath Coal Co., Bussey, Iowa, have been equipped with press-locked renewable teeth. The accompanying illustration of a part of the lip of a bucket shows worn shanks and a new tooth from stock to show the shape and method of tooth attachment.

The shank at the right with tooth applied happens to be sitting wrong side up, that is, opposite to the way it goes onto the lip of the bucket. The front end of the shank has a depression on each side which is covered over when the tooth is slipped on. Then a press is used to force the sides of the tooth into the depressions. Worn teeth can be removed with a cutting torch or by a hammer and wedges. The bucket shown is a 24-yd. Omaha unit made by Mount, Williams & Drake Co. Shanks and teeth were made by the H. & L. Co., Huntington Park, Calif.

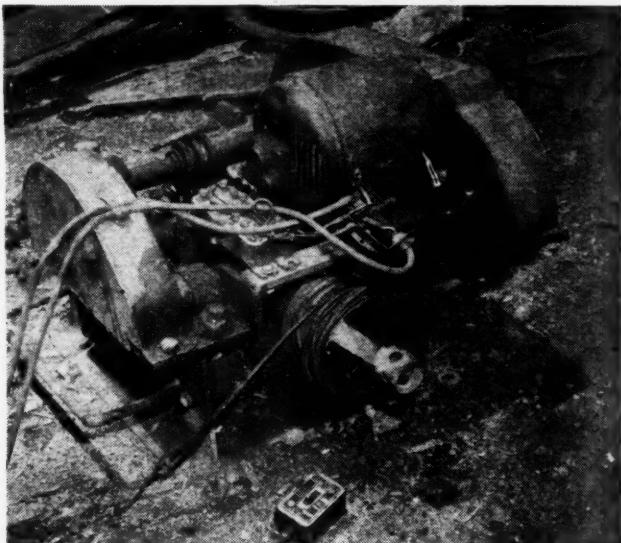
Lip of repaired bucket with some new shanks and a tooth.



## Worn Locomotive Tires Trimmed Without Removing Truck



One of the two centering frames, showing its normal position when the centers are holding the axle of a locomotive as if in a lathe.



Hoist which rotates the locomotive tire at 10 in. per minute. The remote-control switch cord is on the ground in front. Three spur gears and one worm reducer are employed.

SLICING OFF the false flanges and trimming the true flanges of locomotive tires by acetylene torch is the maintenance method followed at the Mahan (W. Va.) mines of the Christian Colliery Co. R. F. Overly, general superintendent, found this method in use when he came to the property four years ago and continues it because he finds it cheaper than turning or arc welding. The secret of low cost with torch trimming is a device built by William Chapman, chief electrician, to do the job without removing the truck from the locomotive, whether it is of the inside- or outside-frame type.

The cutting is done by rotating the tire with the gas torch clamped in a fixed position. Rotation of the tire is done by an electric hoist pulling a  $\frac{1}{8}$ -in. wire rope wrapped around the other tire of that truck. The torch is clamped in a universal holder and attached to a frame carrying the center screw which fits in the end of the axle.

One of two frames constituting the truck-centering part of the outfit is shown in the accompanying illustration. It is hooked over the rail end and is leveled by two screws, the ends of which

rest on the ties or suitable blocks placed on the ground. The threaded block containing the center screw is adjustable vertically through a 4-in. range and can be locked by bolts at the back.

Procedure is to run the locomotive into the shop or under a pit shed where there is a crane and lift it so the tires clear the rails. Then the centers are screwed into the axle of a truck on which a tire is to be trimmed and the screw blocks locked in a fixed position. The hoist then rotates the truck so that the periphery of the tire moves past the torch at approximately 10 in. per minute.

The hoist was built from discarded parts found around the mine. Speed reduction is accomplished through three spur gears and one worm reducer. To facilitate paying out the wire rope and taking up the slack, the drum is mounted free on the worm reducer shaft and is driven by ratchets fixed to the shaft, which can be disengaged. A remote-control switch on a portable cord is provided for the torch operator. Attachment of the end of the wire rope to the periphery of the tire is done by tacking the hook on by arc-welding. Treads of tires trimmed by this method are relatively smooth and cause no difficulty even on the initial runs.

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...smoothly...when controlled by  
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Restarts Automatically With Power Resumption  
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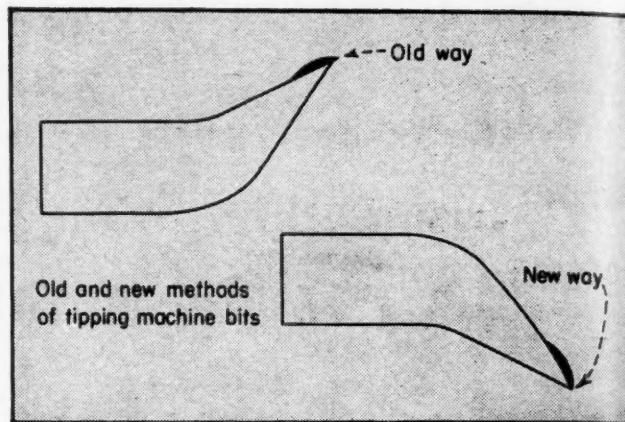
MANSFIELD, OHIO

Canadian Ohio Brass Co., Ltd., Niagara Falls, Ontario

## Cutter Bits Tipped on Back

A NEW WAY of tipping cutting-machine bits is recommended by John M. Williams, electrician and machinist, Rex Carbon Coal Co., Florence, Colo. The coal, Mr. Williams writes, is very hard and formerly involved considerable time for sharpening. As a result, he instituted tipping in accordance with general practice in the field. An improvement resulted, but it still required a number of bits to run the mine one shift.

In an attempt to increase tip life Mr. Williams decided to try applying the hard-facing material (Haystellite) to the back of the point. As a result, he declares, twice the service is obtained as compared with tipping on the front—or top of the point. The new and old ways of applying the material are shown in the accompanying illustration. With the old method, wear on the back was rapid and the bit chipped off. With tipping on the back, the wear is slow and chipping off of the base is practically eliminated, Mr. Williams reports.



## Diesel Electric Locomotive Turns Its Own Tires

HAVING a spare 65-ton diesel electric locomotive would be expensive. Shutting down a large strip mine for several days for changing trucks (if spare ones were on hand) and/or sending these trucks away for turning the tires likewise would be expensive. Red Ember mine of the Trux-Traer Coal Co., Fiatt, Ill., operates but one 65-ton diesel electric unit and for it the shop mechanics devised equipment to

turn the worn tires to original contour without taking the locomotive out of daily service. It is a standard-gage unit and hauls mine-run coal three miles from a truck-transfer tipple to the central washing plant.

The diesel-electric power plant of the locomotive furnishes the power for turning the tires. The portable equipment, made in the coal company's shop, is compact and relatively light in weight. The illus-

tration shows all parts in front of the shop door. The box on the hand truck contains the cutting tools, wrenches and so on. The gage for tread and flange contour is on the ground propped up against the box.

When the locomotive has been spotted where the turning is to be done, the frame is jacked up about 2 in. and rested on secure blocks. Next, the drive motors are jacked up until the axle boxes raise the axles sufficiently for the wheel treads to clear the rails. The journal-box covers of the truck to be turned are opened and the end-play thrust brasses are removed. Then the centering frames ("D" in the illustration) are applied by bolting them to the boxes through the holes that held the thrust plates. When the centering bolts are screwed up to proper tension in the axle centers, the truck is held in a fixed position with regard to the journal boxes and the ground, but is free to rotate.

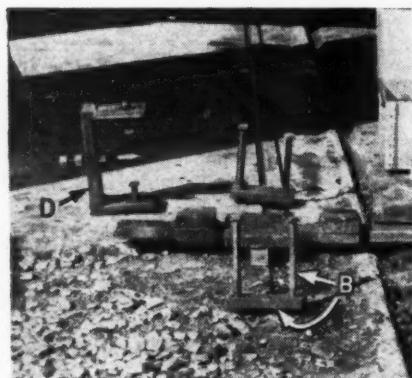
Bar "A," to which the compound rest is to be attached, is placed on the track, wedged to the proper angle and clamped securely to the rails. This is done with the plates and long cap screws, "B," the plate being placed under the rail and the cap screws inserted through holes in the bar. Next, the compound rest for the cutting tool is bolted to one end of the bar for turning the tire on that side.

Showing prominently in the illustration is a narrow-gage track that has no connection with the job. Outside it, but practically concealed, are the rail ends of a wide-gage track. The clamp plates and cap screws "B," are resting on top of the standard-gage rails.

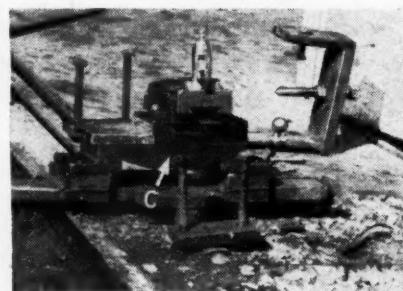
When everything is in readiness for the tire-turning job, the diesel engine and generator of the locomotive are started and the electric controller is adjusted to lowest speed. Brakes are set slightly to steady the motion and hold the wheel speed down to a point where the Carboly cutting tool will stand up under the job. The turning is done nearly as fast as it would be done in a lathe. About eight hours were required to do the two wheels of each truck.



Entire turning equipment placed at shop door for photographing.



Showing the compound rest placed in position on the track bar but not bolted.



Track bar wedged to proper angle on top of the rail, where it will be clamped with plates and cap screws fore and aft. On each side are the bar pads to which the compound rest will be bolted.

# THE LABOR CRISIS

## ...“Absolute power corrupts absolutely”

THE NEW CONGRESS is going to overhaul the federal laws governing organized labor.

If the election returns left any doubt about that, John L. Lewis has removed it by torturing the nation with its second soft coal strike in six months.

If, however, the overhauling is to get at the roots of our labor troubles, it must go further and deeper than most of the proposals would go. Indeed, it must not stop until it has dealt decisively with that most basic cause of devastating trouble—the entrenched monopolistic power of enormous international unions, now concentrated in a handful of union leaders. Industry-wide collective bargaining is one outgrowth of this power.

“Power tends to corrupt, and absolute power corrupts absolutely.” That great truth, phrased by the historian Acton, is as true of labor leaders as it is of business leaders, princes or potentates. It is also true that John L. Lewis and some of his fellow labor leaders now wield what approaches absolute power in their respective domains. Failure to recognize these facts and act on them can make a tragic mockery of the present opportunity to restore good sense and good order to our labor relations and our national life.

To realize this opportunity the labor monopoly must be made a major target.

In the minds of many people, particularly in the business community, the root cause of our labor troubles is to be found in the National Labor Relations Act, commonly called the Wagner Act. They feel that if they could get rid of the one-sided handling of a number of key labor problems provided by that act and its administrators, we would have the legislative part of the problem of creating good labor relations pretty well solved.

To be sure, there is occasion, long overdue, to balance up the lopsided treatment of labor relations by the Wagner Act and those who apply it. It has been so interpreted and applied as to deny free speech to employers. On occasion it has ex-

tended the special protection of the federal government to workers striking to force employers to break the law. It has done the same for workers striking to force the federal government to change its policy the way the strikers want it changed.

The Wagner Act has required employers to bargain with unions, but imposed no companion obligation upon unions to bargain with employers. It has given protection to workers who have broken their agreement by striking. It has been applied so as to break orderly lines of management by encouraging and giving special protection to union organization of foremen who, to do their work efficiently, must represent management. Abuses such as these should be cleaned up, and soon.

### Monopoly is the Target

But if perfection were attained in eliminating all of the abuses stemming from the Wagner Act, numerous and grievous as they are, the basic problem of establishing the legislative foundations of sane and safe labor relations in the United States would by no means be solved. John L. Lewis and his fellow labor dictators would, no doubt, be annoyed, but their power would not be seriously impaired. *That power is derived from monopoly control of labor.* Just as in the case with any other kind of monopoly power, it will only be made subservient to the public interest by attacking it at the source and smashing it.

*The way to do that is to apply the anti-monopoly laws to monopolies in the field of labor just as they are applied to business and industrial monopolies.* At the same time more vitality should be pumped into these laws all along the line.

When our basic anti-monopoly law, the Sherman Antitrust Act, was passed in 1890, it was designed to apply to economic monopolies of all kinds, and was so held by the courts. Organized labor sought exemption from this law, largely on the ground that its bargaining power was weak, as compared with that of industrial corporations. In recent decisions, a majority of the United States Supreme Court

justices have held that, when combined with the Clayton Act of 1914, the Norris-La Guardia Act of 1932 gives organized labor virtually complete exemption from the antitrust laws.

In the meantime, the relative weakness in bargaining power which was made the occasion for exempting organized labor from the antitrust laws has become a myth. In soft coal, John L. Lewis is the monopolist. Through his United Mine Workers he controls about 90% of the miners. No one of the thousand or more highly competitive companies engaged in soft coal mining controls more than about 5% of the output.

In steel the monopoly control is that of Philip Murray's United Steel Workers whose organization represents well over 80% of the production workers in that industry. United States Steel, the corporate "giant," controls only about one-third of the steel making capacity. In automobiles the United Automobile Workers represent about 90% of the production workers. A year ago the union's officers flaunted their monopoly power by announcing plans to pick off one automobile manufacturer after another by a series of centrally controlled strikes.

#### Industry-Wide Bargaining

Confronted by the rise of government-fostered monopoly power in the hands of organized labor, employers in some industries have sought to match it by joining together for collective bargaining on a more or less industry-wide basis. In other industries, notably steel, the federal government, through the War Labor Board, took the lead in forcing a pattern of industry-wide bargaining. Bedevilled by a myriad of cases, the Board thus sought to settle scores of them in the steel industry by one action.

It is easy to understand how an employer, confronted by an industry-wide monopoly of labor, would be tempted to join with his fellow employers in an industry-wide bargaining group. In that way he might see a chance to establish something like equality in bargaining power.

However, if the employers' bargaining group were as effective as the union in creating a monopoly set-up, it would merely confront one monopoly with another. That, in turn, would heighten the chances of having either a devastating head-on collision as a result of failure to agree, or having the two monopolies reach an agreement at the expense of the consuming public.

Actually, however, the chances that employers can create an industry-wide bargaining group as

tight as that created on the side of labor by union organization are virtually zero. For if a group of employers were to agree to shut down in unison or take other united steps to balance the bargaining power created by the threat of a monopolistic union to strike, they would unquestionably find themselves on the receiving end of an indictment for violation of the federal antitrust laws.

#### To Break the Monopoly

Thus, both from the point of view of the public and the point of view of the employer, industry-wide bargaining is no effective offset to the monopoly power created by industry-wide unions.

The only way to cope with this monopoly power is to subject it to the anti-monopoly laws in the same way business and industrial management are subjected. In the process industry-wide labor monopolies would be cut down to safe size, possibly by limiting the percentage of workers in any industry who are permitted to belong to a single labor organization.

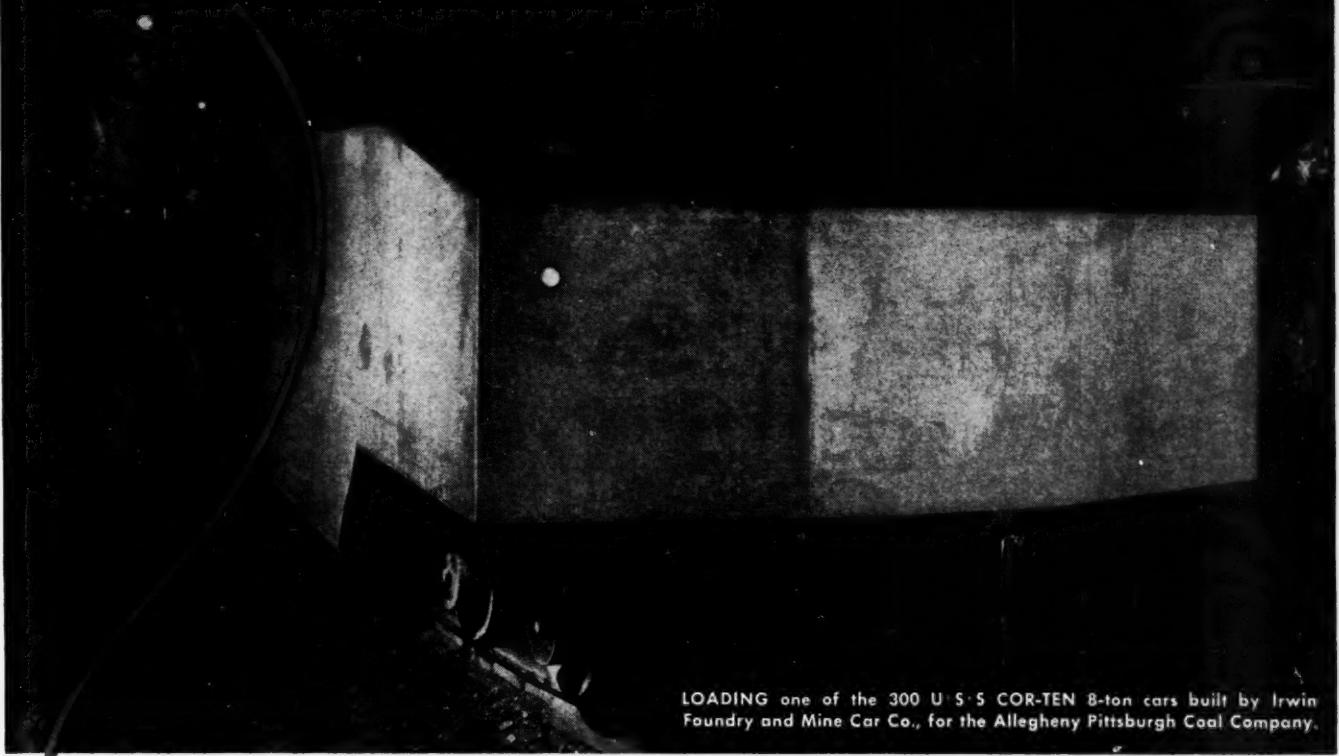
Also application of anti-monopoly laws would clean out local pockets of labor monopoly which block the way of industrial progress. As matters stand, the freedom of unions from control by the antitrust laws permits organized workers in one city to refuse to install equipment shipped in from another city, thus establishing private tariff walls. It also permits organized workers to refuse to install or work on materials made by other workers whose union affiliation, or lack of it, they do not like.

If the anti-monopoly laws were applied to organized labor, boycotts of this sort would be outlawed. In the aggregate they now take a tremendous toll for no legitimate purpose. But primarily John L. Lewis and a handful of his fellow labor dictators might be cut down to a size that can be safely accommodated by the American democracy. If that is not done, the last great opportunity to give industrial and political democracy a chance to work, in its last great stronghold, will be lost. From such a tragic turn of events no one would lose more than the American worker.



President McGraw-Hill Publishing Company, Inc.

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LOADING one of the 300 U·S·S COR-TEN 8-ton cars built by Irwin Foundry and Mine Car Co., for the Allegheny Pittsburgh Coal Company.

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When you build with U·S·S COR-TEN you're using steel that has a yield point 1½ times that of structural carbon steel—that has greater impact strength and abrasion resistance—and whose resistance to atmospheric corrosion is 4 to 6 times higher. That's why COR-TEN has been so successful in prolonging mine car life—in increasing car capacity—and in decreasing weight.

Before you replace worn-out, obsolescent mine cars, find out how to insure top efficiency by building with U·S·S COR-TEN. Our engineers have the facts and will gladly pass them on to you.



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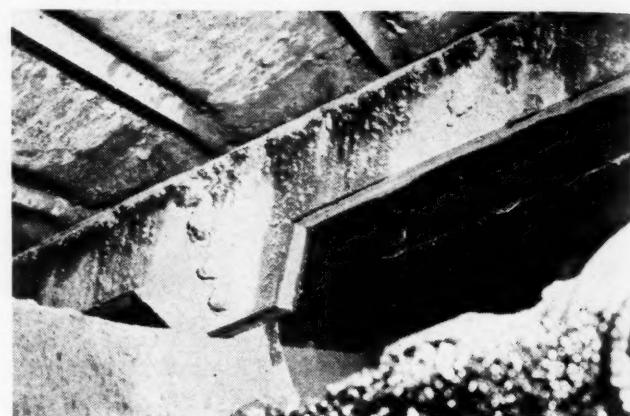
## UNITED STATES STEEL

## Motor Load Reduced by Lubricating Conveyor Center

ADDING lubrication to the center drag-rail support of a wide apron conveyor cut the load on the motor and reduced maintenance by prolonging the life of cast-iron shoes and the wooden rails. This unit conveys mine-run coal from the bottom of the truck-dumping hopper to railroad cars at Red Ember mine of the Truax-Traer Coal Co., Fiatt, Ill.

As indicated in the illustration showing the wooden rail supporting the top run of the conveyor, the oiling system consists of a  $\frac{1}{2}$ -in. pipe set in a groove along the center of the top side of the rail. This pipe, fed by gravity from an overhead tank, has small holes drilled in it to distribute the oil. The aprons, or pans, are 6 ft. wide and are not strong enough to carry the heavy load of coal without the center support. Bolts fasten the cast-iron shoes to the pans.

Dry operation of the drag-rail, shown in this view of the underside of the top run of the 6-ft. apron conveyor, was the original intent, but experience proved that lubrication reduced load and wear.



## Pump Tester Improves Maintenance of Truck Diesels

A NEW MACHINE built in the mine shop makes it unnecessary to return the fuel pumps and cylinder injectors of the Cummins diesel engines used on coal-haulage trucks at the Red Ember strip mine of the Truax-Traer Coal Co., Fiatt, Ill., to the factory for repairs and testing. In one of the illustrations, Scott Keetauer, chief garage mechanic, is shown beside the machine, which has its dust protecting metal cover raised and folded back ready for the machine to be put to use.

Drawers in the cabinet at the left hold the auxiliary parts and tools and its top is used as a bench. Power to operate the pump is furnished by a 3-hp. motor with Reeves variable-speed drive. Above it and to the right is the storage reservoir for the fuel oil. The whole machine is on small wheels, consisting of discarded ball bearings, making it easy to move to a different location in the shop.

The close-up operating illustration of the upper part of the machine shows a pump on test and the fuel oil pouring from an open cylinder nozzle into a metal cup. When operated at 1,400 r.p.m., as indicated by a tachometer on the back panel, a portable revolution counter is applied to the end of the line shaft and the quantity of oil ejected is measured for 500 revolutions. An adjustment is made to bring the quantity to 20 c.c. and the adjusting nut is sealed at that point.

Before making that adjustment, however, the pump lubricating pressure is checked and then the unit is operated for a break-in period of two hours at 650 r.p.m. Next, the pump is brought up to 1,800 r.p.m. and the fuel oil pressure checked to see that it is between 140 and 150 lb. The pump speed also is raised to determine if the governor cuts the fuel delivery at 2,000 r.p.m. This governor limits the trucks to

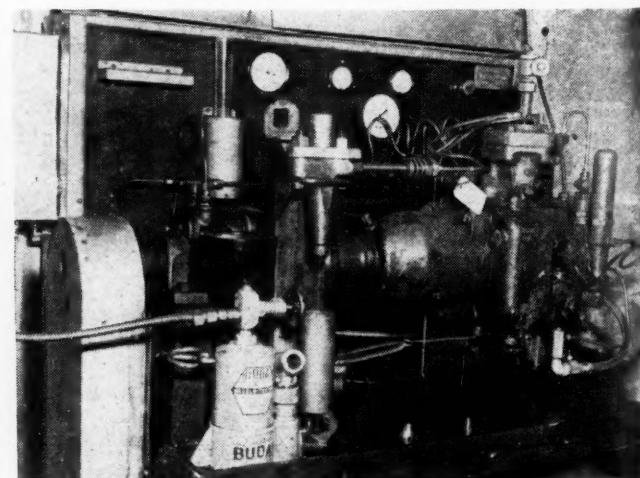
reasonable speeds while on the road.

A Buda nozzle tester, a hand-operated hydraulic pump, is shown left of the center in the foreground. First, a solid, or blank, injector cup is screwed onto the nozzle and the pressure is raised to 3,000 lb. per square inch to check for leaks. Next, the regular tip, or injector cup, is attached and a check made to see that oil squirts out of each of the six 0.006-in. holes. For this test a funnel-shaped top piece with rim is placed on the cup to confine and catch the spray or oil.

The whole testing machine assembly resembles a factory product. The top shaft to which the pump is attached runs in two 1-in. ball-bearing pillow blocks. Instruments on the panel board are as follows: (1) tachometer, (2) low-pressure gage for lubricating oil, (3) low-pressure gage for fuel-oil pump test and (4) high-pressure gage for injector test.



When they check O. K. on this machine, diesel fuel pumps and injectors are sure to be right.



An electric motor connected through a variable-speed gear drives the pump and fuel oil squirts from an open nozzle into the cup.

# Another New Mine Uses

## TIMKEN BEARING EQUIPPED CARS



Timken Bearing Equipped cars at  
Garden Ground Mine.

When the New River Company, Mt. Hope, W. Va., placed its important new Garden Ground Mine in production early this year, mine cars equipped with Timken Bearings were ready to do the hauling. To date, 200 very large drop bottom cars manufactured by American Car & Foundry Company have gone into service at the Garden Ground Mine. Additional cars will be purchased as required. Not every tapered roller bearing is a TIMKEN Bearing. Look for the registered trademark "TIMKEN" on every bearing you use.

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# News Round-Up



## Lewis Ends Bituminous Stoppage As Contempt Case Goes Higher

Bowing to administration and court pressure, John L. Lewis Dec. 7 unexpectedly called off the 17-day-old bituminous strike just as the nation was beginning to coagulate from a crippling paralysis resulting from power cuts, brown-outs, steel cutbacks, rail slashes, industry lay-offs by the thousands and lost millions in wages and sales.

In his order to the miners, Lewis explained that review of the contempt of court judgment by the Supreme Court, later set to begin Jan. 14, would guarantee the miners their rights and the return to work would remove any possible prejudice in the hearing. The union, he said, would continue under the Krug-Lewis contract until Mar. 31, 1947 and in the meantime would be willing to negotiate a new contract with either the operators or any agency of the Government.

The fining Dec. 4 of the United Mine Workers, \$3,500,000, and Lewis personally, \$10,000, by Judge T. Allan Goldsborough of the Federal District Court for the District of Columbia climaxed a three-day trial and the decision the previous day that Lewis and the union were guilty of both civil and criminal contempt. An all-day recess of the court until 3 p.m., while counsel for both sides conferred, had led many observers to hope that a last-minute settlement was being evolved, in which the miners would go back to work while a new contract was negotiated with the operators in return for a suspended sentence. In passing sentence, Judge Goldsborough followed the suggestion of the Government that the union be fined \$250,000 a day for each day of the strike but expressed his regret that the Government had not requested criminal penalty on the basis that a jail term would not mine coal and he, therefore, was not sentencing Lewis to jail. The judge characterized the strike as "an evil, monstrous thing," that "means hunger and cold and destitution" for the American people, and a "threat to democratic government itself."

### Fines Bitterly Protested

In discussion of the proposed fines, the defense counsel protested bitterly that such sums suggested by the Government were "unjust, improper and outrageous." Joseph A. Padway, AFL counsel, assisting the U.M.W., charged that the Government was trying to put the union out of

business. Welly K. Hopkins, chief U.M.W. counsel, told the court that the miners were breadwinners for perhaps 3,000,000 people on whom the Government was seeking to lay a "heavy hand." "Shame on a Government that would try to perpetrate such an outrage," he cried loudly. "This day, Sir, shall live in infamy," he told the court, and contended that the Government was placing a "crown of thorns" on the miners' heads to further the administration's political aims.

Immediately following the sentencing, the defense gave notice of appeal to the Circuit Court of Appeals, and after argument, the Government agreed to a stay of sentence for appeal. Judge Goldsborough also signed a temporary injunction continuing the restraining order on which the court action had been based, making it possible to hold the union in further contempt if it continued to disregard the order.

### Court Order Held Illegal

In the court trial and the preceding legal skirmishes, the union maintained that the court's restraining order was in violation of the Norris-LaGuardia Act of 1932 and, therefore, that in its failure to obey it could not be considered guilty of contempt. The order secured by the Government had directed Lewis to withdraw his notice of the termination of the Krug-Lewis contract, and by such action instruct the miners to return to work, before the Nov. 20 deadline Lewis had set. The union chief ignored the order, maintaining complete silence, and on Nov. 21 bituminous miners throughout the country failed to report to work. In fact, thousands jumped the gun by as much as four days, with over 100,000 miners out the day before the Lewis deadline.

Immediately following the walkout, Judge Goldsborough cited Lewis and the union for contempt, setting the preliminary hearing for Nov. 25. Argument on the validity of the order took place that day and on the following Wednesday the actual trial began. Friday morning, Nov. 29, the court ruled against dismissal of the case and in denying the union's grounds for ignoring the order, said: "The Norris-LaGuardia Act did not apply and does not apply. . . It is perfectly clear that. . . the court has the right to enjoin a labor union which is about to take steps that would be

against the public interest, including the ultimate interest of the union itself."

Throughout the trial the Government's position rested on the contention that the Krug-Lewis contract could not be terminated, that the Government, in protecting public welfare threatened by the strike, was not bound by the Norris-LaGuardia Act, and that it had not asked for the restraining order to prevent a strike but rather to maintain the status quo until the question of the termination of the Krug-Lewis agreement could be legally determined. Witnesses were presented by the Government to prove that the Government was in actual possession of the mines and that the stoppage was causing irreparable damage to the nation's economy. The union admitted its failure to comply with the order and based its defense wholly on its contention that the order was illegal.

After the Court announced its findings Dec. 3, Lewis arose and reading a statement, assailed the Court for "government by injunction," asserting that the decision violated the law and the Constitution and deprived the miners of their constitutional rights. "I cannot, by action or inaction," he said, "acquiesce in what must be described as the ugly recrudescence of 'government by injunction'."

### Government Stands Firm

Lewis' strike call and the Government action followed a rather unexpected reversal by President Truman from his previously reported stand that the Krug-Lewis contract could be reopened. Discussions during the early part of the month between officials of the Coal Mines Administration and the union were later joined in by Lewis and Secretary Krug on the latter's return from his western trip. Still maintaining that the Krug-Lewis agreement was for the duration of government operation, Secretary Krug made unsuccessful attempts to have the union and the operators resume negotiations, with the current status continuing until an agreement was reached and the mines could be returned to the operators. On Nov. 15 President Truman announced that Attorney General Clark had advised him that the contract could not be modified except by mutual agreement or by petition under Sec. 5 of the Smith-Connally Act. The President said he considered "fair and equitable" the Krug plan that had been submitted to the union the day before and agreed to by the operators. In this plan a 60-day truce was proposed, with the Government continuing operation of the mines while negotiations went on between

the operators and the union. If after 30 days no agreement had been reached, price limitations would be removed and any agreement subsequently reached would be retroactive to that date. If by the end of the 60-day period, or Jan. 16, 1947, a contract was not made, the Government would turn the mines back to their owners and "the normal operation of economic forces would then prevail in the coal industry."

Following the President's final word Lewis, on Nov. 15, gave formal notice that the contract with the Government would end as of Nov. 20. Secretary Krug immediately replied that the union had no power to terminate the contract and the next day the Government appealed to the miners to stay on the job. Upon the President's direct orders "to fight John L. Lewis on all fronts" the ensuing court action was immediately started. All bituminous supplies were frozen Nov. 16, with only those with less than 10 days supplies eligible to obtain more. A 25-percent cut in railroad passenger travel by the ODT Nov. 18 was followed by a brown-out order effective in 21 States and the District of Columbia issued by the Civilian Production Administration Nov. 22. Secretary Krug, as Solid Fuels Administrator, Nov. 23 urged the Governors of all States by proclamation or otherwise to encourage their communities to conserve coal by all means possible. An embargo on all rail shipments except essential commodities and supplies and a limitation on parcel post shipments was announced Dec. 4, effective at midnight, Dec. 6.

The Coal Mines Administration announced Nov. 30 that it had approved numerous applications by operators to fine individual miners for "illegal" striking, on the basis that the agreement was still in full force and effect. The fines range from \$1 to \$2 and if finally upheld would go into the medical and hospital fund administered by trustees appointed by Lewis.

The resignation of Edward R. Burke as president of the Southern Coal Producers Association was announced Dec. 3, presumably as a direct result of his proposal, Thanksgiving Day, that the miners go back to work and direct negotiations be resumed with the operators. His statement that the operators were willing to discuss a contract at any time was later disavowed by the directors of the Association who in their statement of Mr. Burke's resignation said, "When the operation of the mines is resumed then the question of an orderly negotiation of a collective bargaining agreement will become an appropriate one."

Appearing before the House investigating committee Dec. 2, Secretary Krug announced that the Government had made arrangements to lease the Big and Little Inch pipelines for the transmission of natural gas into Indiana, Ohio, Kentucky, Tennessee, West Virginia and Pennsylvania stamping their approval on the National Coal Heating Service plan and laid the groundwork for regional machinery to promote the plan at an all-day meeting in the Queen City Club in Cincinnati, Ohio, Nov. 8. Four committees made preliminary reports calling for the appointment of regional advisory committees for the Cincinnati area, the Chicago area, the Far West and the East, preparation and distribution of adequate promotional materials, integration of producer and wholesaler salesmen into the program and a new emphasis on the sale of service as well as coal.

## Coal Activity

### Bituminous Coal Stocks

	Thousands		
	Net	P.c. change	
	Tons	From	From
Oct. 1, 1946	14,563	+4.7	-6.2
Sept. 1, 1946	14,946	+13.3	+28.1
Total.....	52,367	+9.1	-1.8

### Bituminous Coal Consumption

	Thousands		
	Net	P.c. change	
	Tons	From	From
Sept., 1946	42,424	+2.1	+7.4
Total.....	42,424	+2.1	+7.4

\* Includes beehive coke ovens, manufactured-gas plants and cement mills.

### Bituminous Production

October, 1946, net tons.....	56,000,000
P.c. change from September, 1946.....	+8.6
Jan.-Oct., 1946, net tons.....	447,499,000
P.c. change from Jan.-Oct., 1945.....	-6.4

### Anthracite Production

October, 1946, net tons.....	5,407,000
P.c. change from September, 1946.....	+7.1
Jan.-Oct., 1946, net tons.....	50,613,000
P.c. change from Jan.-Oct., 1945.....	+9.1

### Sales, Domestic Stokers vs. Oil Burners

	Oil	
	Stokers	Burners
September, 1946.....	18,641	48,644
P.c. change from Sept., 1945.....	+39.3	+197.0
Jan.-Sept., 1946.....	140,051	291,483
P.c. change from Jan.-Sept., 1945.....	+109.9	+290.5

### Index of Business Activity\*

Week ended Nov. 23.....	184.3
Month earlier.....	185.3
Year earlier.....	168.8

\* *Business Week*, Nov. 30

### Electric Power Output†

Week ended Nov. 30, kw-hr.....	4,448,193,000
P.c. change from month earlier.....	-3.3
P.c. change from year earlier.....	+10.0

† *Edison Electric Institute*.

## Sales Group Boosts Coal-Heat Service

More than 100 coal sales executives and wholesalers from Indiana, Ohio, Kentucky, Tennessee, West Virginia and Pennsylvania stamped their approval on the National Coal Heating Service plan and laid the groundwork for regional machinery to promote the plan at an all-day meeting in the Queen City Club in Cincinnati, Ohio, Nov. 8. Four committees made preliminary reports calling for the appointment of regional advisory committees for the Cincinnati area, the Chicago area, the Far West and the East, preparation and distribution of adequate promotional materials, integration of producer and wholesaler salesmen into the program and a new emphasis on the sale of service as well as coal.

Details of the national plan were outlined by J. Nelson Stuart, manager, National Coal Heating Service, in a lively question period. With Mr. Stuart at the meeting were three members of the National Coal Association's Marketing Com-

mittee: B. R. Gebhart, vice president, Chicago, Wilmington & Franklin Coal Co., Chicago; M. L. Patton, president, Cabin Creek Consolidated Sales Co., Cincinnati; and H. A. Glover, vice president, Island Creek Coal Co., Huntington, W. Va. R. D. Stockdale, president, Red Jacket Coal Sales Co., Columbus, Ohio, presided at the meeting. Chairmen of the four reporting committees were: Committee 1, C. R. Griffith, president, Southern Coal & Coke Co., Knoxville, Tenn.; Committee 2, J. M. Daniel, sales manager, Stearns Coal & Lumber Co., Stearns, Ky.; Committee 3, Fred Legg, president, Logan & Kanawha Coal Co., Cincinnati; and Committee 4, Elmer Wierhake, vice president, Smokeless Fuel Co., Charleston, W. Va.

## Big Inch Bids Rejected by WAA

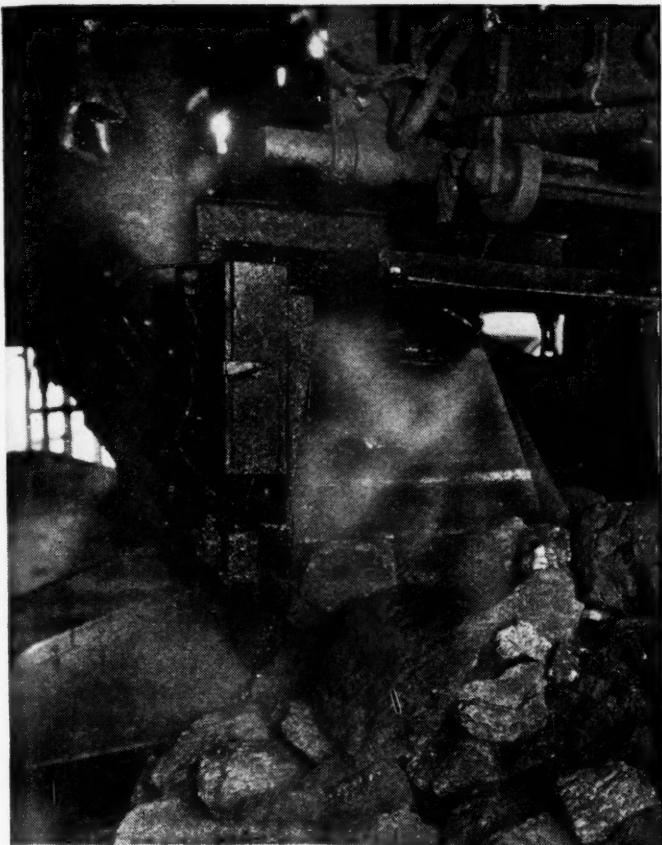
Pressure to move natural gas through the Big Inch pipelines to the East increased last month as the bituminous strike choked off coal supplies and the War Assets Administration announced rejection of all bids submitted for both the Big and Little Inch lines. Spokesman for three pipeline companies told the House surplus property committee that their firms could move 90,000,000 cu. ft. a day through the lines within two to four weeks and that the supply could be boosted to 225,000,000 cu. ft. daily within 90 days. Total capacity of the lines—425,000,000 cu. ft.—would equal about 3 percent of the daily coal consumption in the New York, Philadelphia and Newark area.

Pointing to clarification of the Army-Navy Petroleum Board's stand, which expressed no preference in the disposal of the two pipelines for oil or natural gas, Robert M. Littlejohn, War Assets Administrator, announced Nov. 19 that all 16 bids for the lines had been rejected and outlined a new policy whereby they may be made available for bringing natural gas to New York and Philadelphia. Their rejection, he said, was based on the fact that none of the bids guaranteed a fair price in terms of the current appraisal value of \$113,700,000. The two lines, built in wartime at a cost of \$147,756,622, parallel each other from Texas fields to the East.

## New Developments Among Operators

Purchase by the Pittsburgh Consolidation Coal Co. of the Cassville and Osage mines of the Christopher Coal Co., near Morgantown, W. Va., at a cost of \$1,000,000, was reported last month. The purchase was said to have been made primarily to secure plants, tipplers and other equipment since the mines are almost worked out. Pittsburgh Consolidation holds undeveloped acreage near the properties.

Expansion of operations by the Carpenter-Town Coal & Coke Co. at its property at Mt. Pleasant, Pa., has been reported, with additional slope openings made on the south side of the area. A two-mile extension by the Pennsylvania R.R. will be



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- FREEZEPROOF
- LESS WINDAGE LOSS
- BETTER STOKER FEED
- NO CORROSIVE ACTION
- HELPS SALES



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required, and a new three-track tipple, screening plant and picking tables, to be completed by the first of the year, are now under construction. A daily production of 2500 tons is anticipated.

The Buckeye Coal Co., Nemacolin, Pa., has begun a new shaft in the western section of its property in Greene County, Pa. The two-compartment shaft is reported to be concrete lined, 485 ft. deep.

According to a recent announcement by Frank F. Kolbe, president of the United Electric Coal Cos., Chicago, the company's new Buffalo Creek mine in Kentucky was expected to be in production by early December. A yearly capacity of 350,000 tons is expected when the mine is fully developed, increasing the company's output 10 percent. Mr. Kolbe also stated that the end of the company's fiscal year would see most of the new equipment installed. More than \$2,000,000 of machinery was on order, he said, the largest item of which was the \$1,000,000 washing plant for the Cuba, Ill., mine, under construction.

Formation of the Buckeye Furnace Mining Co. by Frank C. Ford and Max Morrow, originators of the Morrow Mfg. Co., was announced recently. Immediate production is expected from a mine being developed on the Baltimore & Ohio R.R. near Wellston, Jackson County, Ohio. The Upper Freeport seam is being mined and a completely modern tipple, including the latest preparation facilities, is under construction. Only two sizes, domestic lump and stoker, will be produced and dustless oil treatment will be available.

Authority for the construction of 2.5 miles of railroad to connect present lines with the mine of the Blue Bird Coal Co., Carrier Mills, Ill., has been requested of the ICC by the New York Central and Big Four R.R.'s.

A sale agreement between P. R. S., Inc., and the McLaren Coal Co. has been reported, under which the McLaren strip-mining plant near Carterville, Ill., is to be operated by the P. R. S., Inc. Operation by the company will be supervised by Dennis K. Pickens, president, and Charles Hamor, superintendent, who reportedly are planning to reside in Marion, Ill.

The Union Colliery Co., St. Louis, recently announced that construction has begun on a new preparation plant at Dowell, Ill., for its new Kathleen mine. Daily production of 5,000 tons from the Kathleen mine is expected by the middle of next year.

Reopening of the Breese-Trenton Mining Co.'s mine near Breese, Ill., closed since a shaft cave-in last February, was reported last month. The mine formerly produced 1,000 tons daily.

The War Assets Administration has offered for sale or lease a coal mine at Wilkeson, Wash., with a rated yearly capacity of 100,000 tons of coking coal, formerly operated by the Wilkeson Products Co. The site contains 2,000 acres and an estimated undeveloped coal reserve of 18,000,000 tons. A washing plant and underground equipment and machinery is included and the mine has a Northern Pacific R.R. siding. The WAA is also offering a coke plant at Tacoma, with a rated capacity of 75,000 tons of coke, 900,000 gal. of tar and 400,000 cu. ft. of gas.

### The Right to Strike?

"The time has come when we must, not as business men but as citizens, examine and define that word 'strike'. It has been said for a long time that nothing must deprive labor of the right to strike. But if today we mean by 'strike' such a situation as the Pittsburgh power strike, the maritime strikes, the New York tugboat and truckmen's strikes, and the threatened strikes of transportation workers, then labor has no such right, any more than any group has a right to starve, endanger, or destroy the society of which it is a part."

CHARLES E. WILSON  
President, General Electric Company

and it is hoped that the plan will lead to the long sought link between the Pacific Great Eastern Ry. at Pavilion and the C. N. R. and C. P. R. at Ashcroft.

Canadian Collieries (Dunsmuir) Ltd., Nanaimo, B. C., has now opened up their newest coal field at Toable River, approximately 10 miles south of Cumberland, B.C. by air. This new venture, together with the year-old White Rapids mine near Nanaimo, and continued exploration of areas in the Comox basin will play an important part in the future of the company, according to the announcement, along with expanding operations of the company in Alberta.

H. R. Plommer, general manager of Canadian Colliers (Dunsmuir) Ltd., states that diamond-drill exploration work has already indicated that there is sufficient coal in the Comox valley at a discounted estimate to ensure 60 years' operations.

Dr. A. F. Buckham, of the Geological Survey of Canada, estimates the Nanaimo and Comox fields will ensure operations for from 50 to 100 years. Dr. Buckham has been making his headquarters at Nanaimo for the past two years and has been engaged in the remapping of the coal resources of the Nanaimo-Comox basins.

It is believed that exploration may open a fourth field over a wide area from Oyster River north to Campbell River, and if this development continues then the estimate of 60 years' operations is enormously increased.

## Mining and Preparation Subjects Lead Coal-Division Proceedings

A diversified list of subjects ranging from shuttle-car haulage to the combustion of anthracite in glass tubes marked the proceedings at the ninth joint meeting of the Coal Division of the American Institute of Mining and Metallurgical Engineers and the Fuels Division of the American Society of Mechanical Engineers in Philadelphia, Pa., Oct. 24-25. The annual dinner was featured by presentation of the Percy Nicholls Award for notable scientific and industrial achievement in the field of solid fuels to Dr. Arno C. Fieldner, chief, fuels and explosives service, U. S. Bureau of Mines, Washington, D. C.

In an illustrated talk on "Fine Coal Cleaning in The Netherlands," M. G. Driessens, chief, Mining Research Department, Staatsmijnen, Limberg, Netherlands, said the new Dutch cyclone cleaner was discovered as a separator while actually being used as a thickener for reclaiming and thickening the dense suspension in the heavy-media process. A 14-in. diameter cyclone will handle up to 16 tons per hour and is effective in cleaning the  $\frac{1}{4}$  by 0.5 mm. range. The raw feed, water and loess (a claylike substance but possessing a lower viscosity) are released tangentially in the upper region of the cone under a pressure of 30 lb. per square inch. The centrifugal force tends to increase the gravity of the suspension. The coal is recovered at the top and the refuse passes out an opening

in the bottom of the cone.

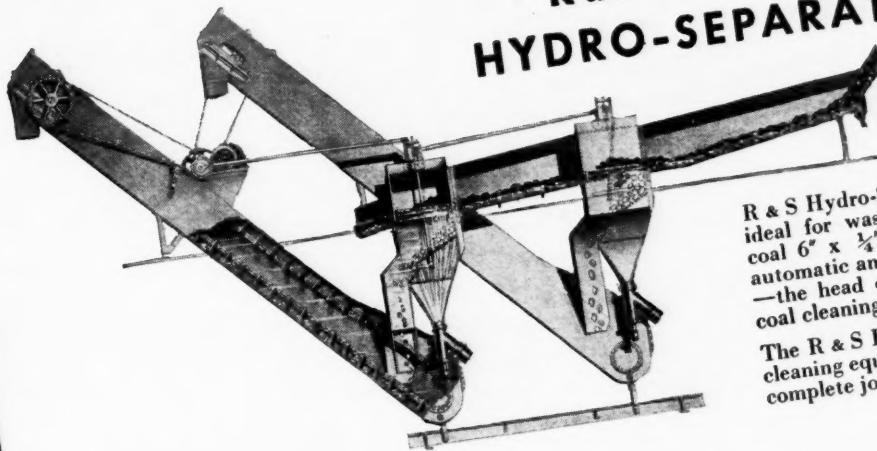
Discussion included questions about the efficiency of the cyclone as a thickener. Mr. Driessens said that under 35 microns (one thousandth of a millimeter) less than 50 percent of the particles are caught. At 100 microns, about 90 percent are caught; and, at 48 mesh, all are caught.

Progress in testing the unit as a coal washer was outlined in a paper entitled "Preliminary Test of Dutch Cyclone Coal Washer," by H. F. Yancey and M. R. Geer, U. S. Bureau of Mines. The project was undertaken because the cyclone seemed to offer unusual promise as a means of extending heavy-medium cleaning to the finer sizes of coal that cannot readily be treated in existing heavy-media processes. Preliminary tests of a laboratory-size unit have demonstrated its high capacity and its ability to make a sharp, efficient separation between coal and impurity at particle sizes down to about 48 mesh, the authors stated. Thus, the cyclone offers promise of extending the size range now treated by heavy-media processes. The principal factors affecting the operation of the cyclone are the specific gravity of the medium employed and the size of the openings through which the clean coal and the refuse are discharged.

A colored movie showing the "Combustion of Anthracite in Glass Tubes" was presented by R. C. Johnson, vice presi-

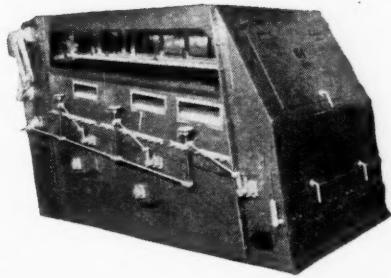
# THE FIRST FAMILY OF COAL CLEANING EQUIPMENT

## R & S TANDEM HYDRO-SEPARATOR



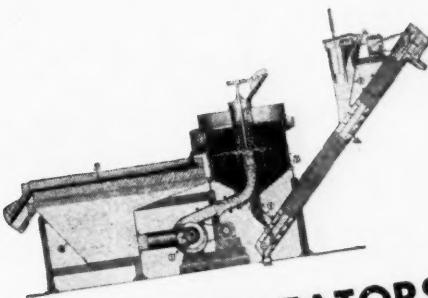
R & S Hydro-Separator is ideal for washing coarse coal 6" x  $\frac{1}{4}$ ". It is fully automatic and continuous—the head of the R & S coal cleaning family.

The R & S Family of coal cleaning equipment does a complete job—a good job.



## R & S STUMP AIR FLOW CLEANER

R & S Stump Air Flow Cleaner is a highly efficient unit where dry cleaning of coal is desirable and the coal amenable to this process. The R & S Family of coal cleaning equipment does a complete job—a good job.



## R & S HYDROTATORS

R & S Hydrotator process for smaller coalsizes  $\frac{1}{4}$ " x 0". In combination with the Hydro-Separator above forms a complete plant . . . promotes total low cost mechanization underground.

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dent, Anthracite Institute. Using a water-cooled, high-silica glass cylinder permits visual observation of the combustion phenomena. Tests were conducted on many sizes of anthracite in cylinders ranging from 2 to 8 in. in diameter and under drafts of  $\frac{1}{2}$ , 2 and 4 in. w.g. It is thought that this laboratory improvement will do much to speed up combustion studies.

The selection of an effective system of recirculating the cinders from the boiler and stack cinder hoppers is most important when burning small sizes of anthracite, reported C. S. Gladden, Hayden Chemical Corp., in a paper on "Burning Anthracite on Chain Grates." The over-all boiler and furnace efficiency is improved to the extent that more of the carbon content of the coal is actually burned.

The moisture content of the coal greatly affects the capacity of the ball mills, said C. H. Frick, Pennsylvania Power & Light Co., in a paper on the "Grinding of Anthracite for Pulverized Fuel." To cope with the high moisture a separately fired dryer is sometimes used to drive off the moisture in the coal to let the milling plant operate on a constant basis the year round. The new Sunbury plant, under construction, will depend on mill drying of anthracite, but for constant flow of coal to the boilers when anthracite is extremely

College, and associates: J. H. Kelley, Richard L. Ash, J. D. Morgan, Jr., W. H. McCracken and William Bellano, traced the development of the shuttle car, pointed up the advantages and disadvantages of the cable and battery-type units and analyzed their performance in a number of mines.

Some of the conditions listed as favoring the battery shuttle car are: bad roof, dry and hard bottom, gaseous and dusty locations, presence of doors and curtains, seam thicknesses under four feet, stowing or gobbing impurities underground and permissibility. Conditions favoring the cable-type shuttle car include: wet and soft bottom, heavy grade and regulations calling for a separate split of air for changing and charging station or for making such stations fireproof. The principal advantages cited for the battery-type shuttle car were its flexibility, greater speed, maneuverability and permissibility.

Four needed shuttle-car improvements were listed as follows: (1) larger tires for better buoyancy in mud and water and better absorption of shock from rough roadways and quick stops; (2) a device which will cut the battery off the circuit when it is discharged to a certain level; (3) improvement of operator's comfort through better design of seats and the addition of safety devices; and (4) redesign of cables, cable

## MEETINGS

• Canadian Institute of Mining and Metallurgy: annual general meeting Jan. 20-22, 1947, Ottawa, Canada.

• International Heating and Ventilating Exposition: Jan. 27-31, 1947, Cleveland, Ohio.

• Electrical Engineering Exposition: Jan. 27-31, 1947, 71st Regiment Armory, Park Ave. & 34th St., New York, N. Y.; held concurrently with winter convention of American Institute of Electrical Engineers.

• Stoker Manufacturers' Association: conference membership meeting, Jan. 28, 1947, Carter Hotel, Cleveland, Ohio.

wet it will use some bituminous coal with the anthracite.

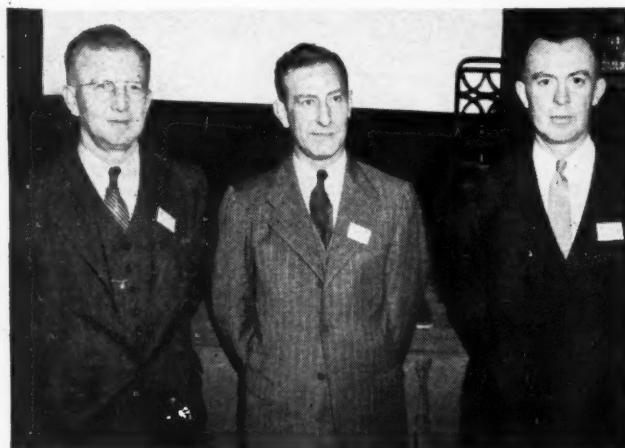
A paper on "Shuttle-Car Haulage," by D. R. Mitchell, head, Department of Mineral Engineering, Pennsylvania State



Preparation co-chairmen (left and right), J. E. Tobey and C. C. Wright, with H. F. Yancey (next to left) and M. G. Driessen (next to right).



Dr. Arno C. Fieldner (right), U. S. Bureau of Mines, receiving the Percy Nicholls Award from Dr. A. W. Gauger, Pennsylvania State College, at the annual dinner, Oct. 24.

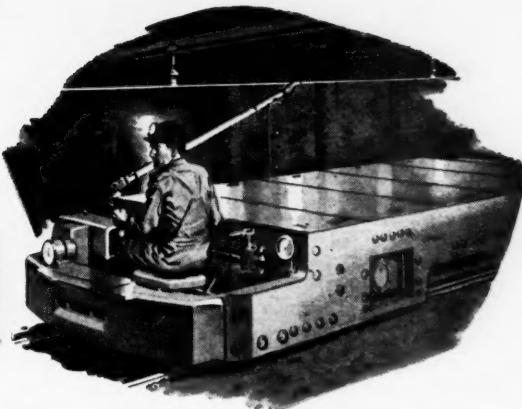


E. C. Payne, leader of panel on coal sizing, with Howard Herder and Carl Mabley.



G. L. Coryell (left), A. W. Thorson, C. S. Sheaffer and D. C. Weeks, coal-sizing panel.

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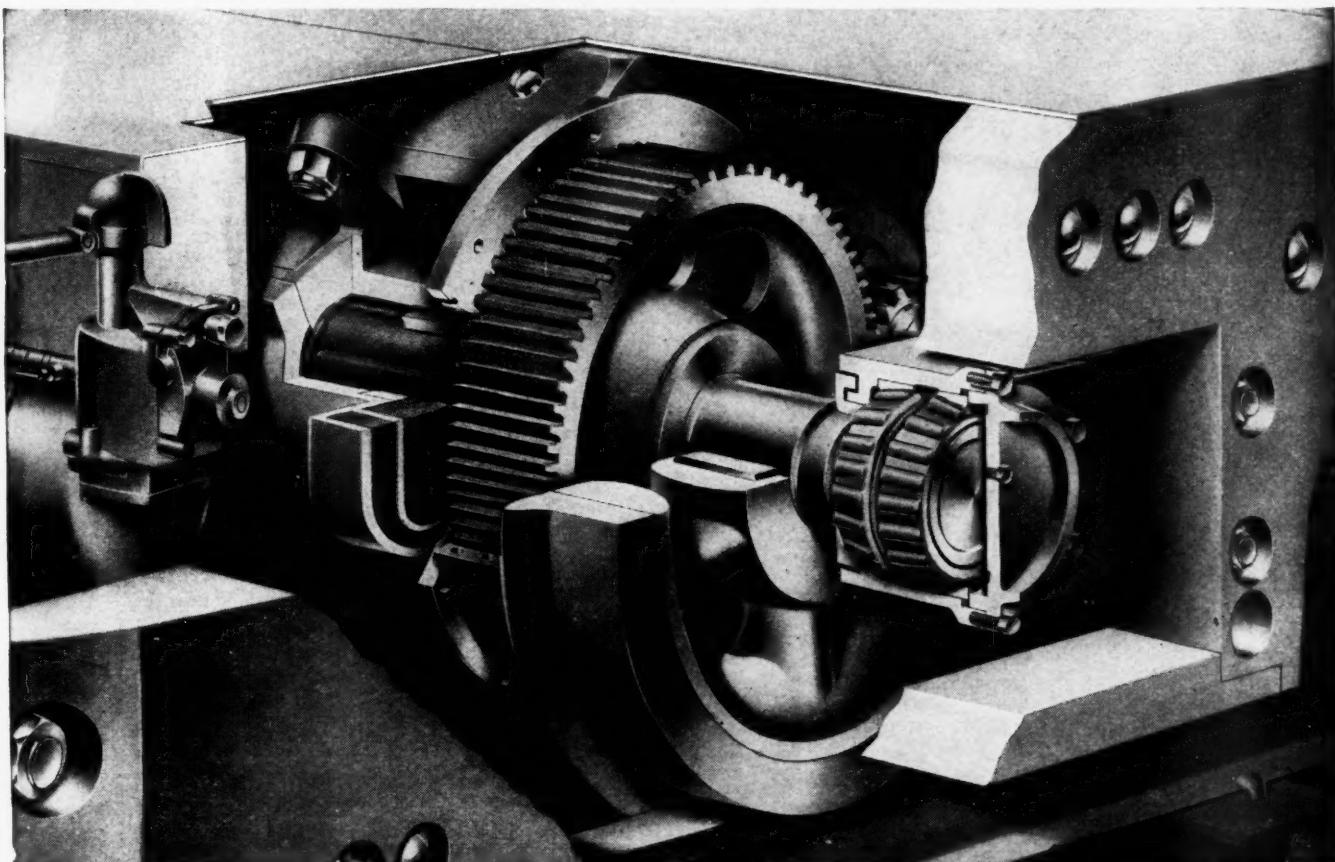
starting and the squeezing pressures of heavy hauls. Viscolite No. 10 Fluid has been developed for this service.

For the motor support bearings, lubricated from waste-packed reservoirs, Viscolite Extra-Heavy is recommended.

\* \* \*

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General Petroleum Corporation

reels, cable-splicing equipment and cable anchorages.

Discharging batteries below the recommended minimum of 1.130 sp. gr., it was stated, tends to build up positive and negative coatings on both plates of the cells. These coatings destroy the use of that portion of the plate which they cover, and since it is of a permanent nature, the capacity of the battery is lessened considerably over a period of continued abuse. The most recent innovation to the battery car design is the parallel-series control, which eliminates the use of power-wasting resistances and increases shuttle-car speed particularly when traveling empty.

In connection with the cable car, the new Federal Safety Code requiring three-conductor cable on rubber-tired equipment restricts the length of cable that can be placed on a reel and also increases the problem of cable repairs. About 100 ft. less three-conductor cable can be placed on the standard shuttle-car reel, as compared to two-conductor cable.

Where operations are troubled with bad bottom it was suggested that asphalt matting, pierced steel planking, corduroy or timber-planked roadways might be tried. Engineering planning and control said Prof. Mitchell, are vital to a shuttle car installation if a high level of performance is to be assured. Time studies are used to de-

### Coal Age Index

Because of the continuing shortage of paper, the index to *Coal Age*, Volume 51, January-December, 1946, is not bound into this issue. However, this index has been prepared and is available without charge to any *Coal Age* subscriber. Address: The Editor, *Coal Age*, 330 W. 42 St., New York 18, N. Y.

termine the weaknesses in the production cycle, while method studies help determine the best procedure for routing and working machines to achieve maximum production.

In the discussion, Fred A. Miller, Consolidated Coal Co., Herrin, Ill., said that three things had contributed to the increase of cable failures during the war years: (1) inexperience on the part of operators of cable shuttle cars, (2) sub-standard types of cable and (3) the manner in which the cable was reeled.

The story of a modern anthracite operation, developed under wartime regulations, was described in a paper entitled "Newkirk Tunnel Mining Practices," by G. A. Roos,

general manager, Philadelphia & Reading Coal & Iron Co. The paper was read by D. E. Ingersoll, district superintendent of the Pottsville division.

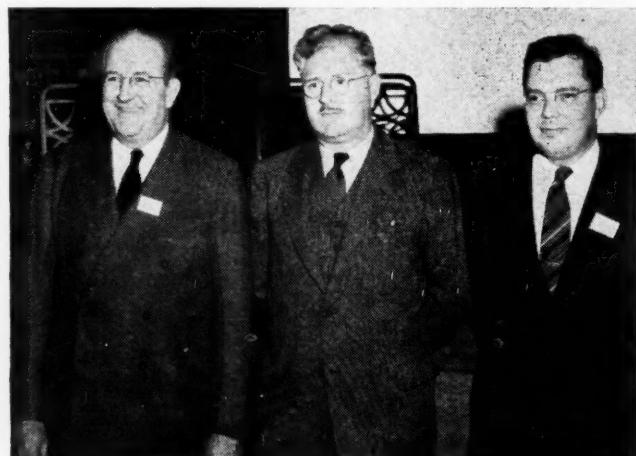
"Modern Haulage to Meet Local Conditions" was analyzed by G. Stuart Jenkins, assistant general manager, Consolidated Coal Company, who reviewed haulage practice at two of their underground operations, Buckhorn and Lake Creek. Large drop-bottom cars (10 to 12 tons) operated between some intermediate point and the hopper feeding the hoist belt, Mr. Jenkins feels, are the final solution to the transportation problem, providing there are no grades over 4 percent.

Power consumption figures for a belt hoist, gathered over a period of years, indicate that about 0.1 kw.-hr. is required per ton per 100 ft. the coal is hoisted. This is about half the requirements of other hoisting methods. Belts for which life was estimated at five to ten years are going to last about ten.

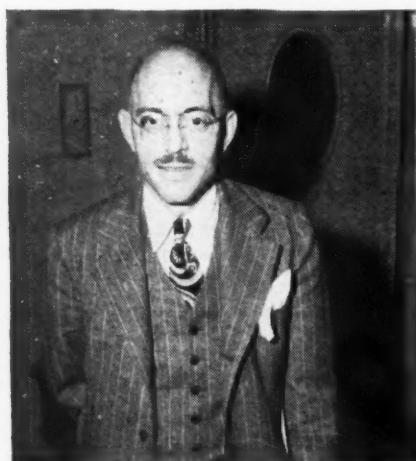
A hopper on the bottom ahead of the slope belt prevents slugging the tipple and thus improves the preparation plant's efficiency. It also facilitates the dumping of trips underground. The first bin at Buckhorn held 100 tons. The present 350-ton bin at Lake Creek is to be enlarged to 2,000 tons to preclude the stopping of the underground haulage system should the



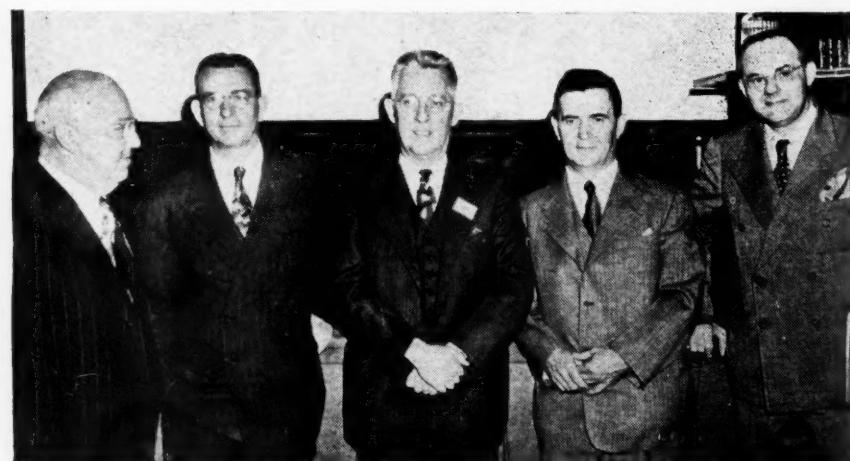
A. A. Raymond (left), R. A. Sherman and Paul Mulcey, coal-sizing panel.



J. E. Tobey, P. R. Broadley and Carroll F. Hardy, coal-sizing panel.



R. C. Johnson, vice president, Anthracite Institute.



L. A. Shipman (left) and John Buch (right), co-chairmen, with speakers on haulage and mining: D. R. Mitchell (next to left), D. E. Ingersoll (center), and G. Stuart Jenkins.

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tipple have to wait an hour or two for railroad cars.

Regarding secondary haulage, Mr. Jenkins said that it had been found that a battery-type shuttle car can operate efficiently on grades up to 6 percent. Over 6 and up to 8 or 10 percent, it is more economical to use the cable-type car. It also has been found advantageous to discharge several panel belts onto a stub-entry belt before discharging to the large cars for the trip to the bottom. Figures indicate that the power consumed by locomotive haulage is about the same as that taken by belt final haulage, which is in sharp contrast with the experience of the belt hoist versus skip hoisting. However, the demand load is increased sharply in the case of locomotive haulage as compared to belt haulage.

In territories where few extreme grades are encountered, the company is attempting to drive rooms parallel to the entries, heading off the rooms with key crosscuts about every 100 ft. to shorten the haul to the panel entry. While this plan necessitates building a considerable number of permanent seals it does make for a productive section when five rooms are used. In this type of installation, the battery shuttle car works to an advantage as there is no crossing of cables and the coal from the five rooms is loaded at a common

#### EQUIPMENT APPROVAL

One approval of permissible equipment was issued by the U. S. Bureau of Mines in October, as follows:

**Joy Mfg. Co., Sullivan Division—  
Sullivan Type 10RU universal cutting machine, rubber-tire mounted;  
50-hp. motor; 220 or 380, 440 and  
500 volts, a.c.; Approvals 564 and  
564A, respectively: Oct. 24.**

point on the panel entry. In this system, five-car trips (cars never uncoupled) placed on the panel entry adjacent to the rooms eliminate the need for a belt on the panel entry. Summing up, Mr. Jenkins said that with shuttle cars, belts and large pit cars they are able to mine profitably large acreages that otherwise would have to be passed up.

A panel discussion on "Why So Many Sizes of Coal" closed the meeting. E. C. Payne, consulting engineer, Consolidation Coal Co., headed the eight-man panel which represented such interests as: (1) the producers, (2) manufacturers of the commercial-type underfeed stokers, (3) the consumer, and (4) research.

## Belt Haulage, Research and "Welfare" Featured by West Virginia Institute

Belt haulage was discussed at length at the 39th annual meeting of the West Virginia Coal Mining Institute, Bluefield, Nov. 15. Other speakers analyzed the "so-called welfare fund" and the program included a paper devoted to BCR research that revealed progress in smokeless stoves and full-automatic ash-removal stokers. Off-the-record talks were made by J. D. A. Morrow, president, Joy Mfg. Co., on "European and American Mining Progress," and by Joseph Pursglove, Jr., president, Pursglove Coal Mining Co., on "Coal Mining in South Africa." J. J. Foster, general manager, Island Creek Coal Co., was elected president for the coming year.

Joseph Pursglove, Jr., president, Pursglove Coal Mining Co., Morgantown, and retiring president of the institute, opened the sessions and presided at the business meeting and dinner. Chairmen of the technical sessions were R. H. Morris, vice president, Gauley Mountain Coal Co., Ansted, and Jesse Redyard, general manager, Redyard Coal Co., Pineville. J. J. Foster, general manager, Island Creek Coal Co., Holden, presided at the luncheon.

C. W. Thompson, mine superintendent, Pardee & Curtin Lumber Co., presented a paper on the company's experience with underground belt conveyors. For the most part this report was confined to Bolair mine, many of the practices in which were described in two recent articles in *Coal Age*, Shuttle Car and Belts Increase Efficiency at Bolair Mine, by J. H. Edwards, August, 1945, and Automatic Controls Essential for Conveyor Operation

Today, by C. W. Thompson, April, 1946. Mr. Thompson also showed colored movies of operations in and about the mine.

Among the advantages of belts emphasized by Mr. Thompson were safety, power savings, freedom from grade restrictions and the large savings in dead work compared to grading tracks through local swags and humps. Economic advantages

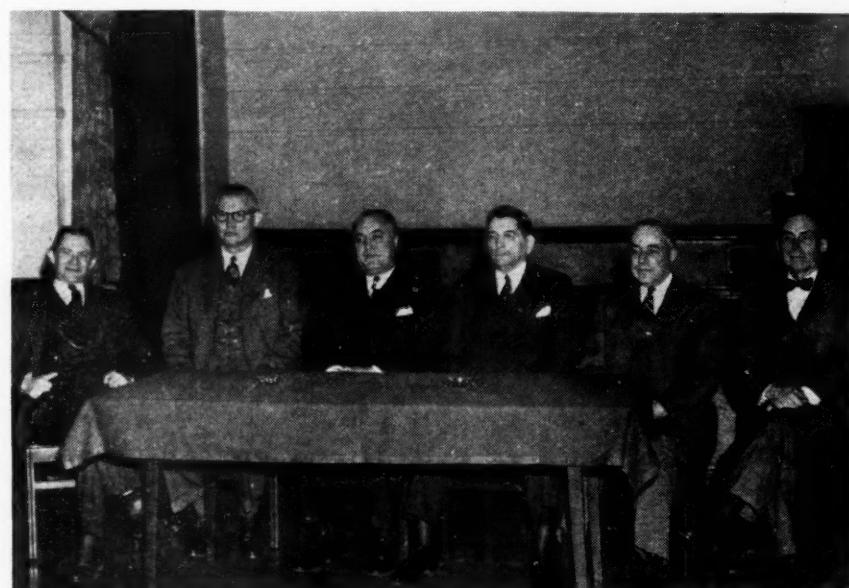
of belts are multiplied in mines designed for higher tonnages per hour. Pardee & Curtin is planning, he said, to have three all-belt-conveyor mines deliver to a new 7-mile outside haul now being constructed to a central plant. On this artery haul, built with 80-lb. steel, 10-ton cars will be operated. A 6,000-ft. belt to be operated by a 100-hp. drive is now being installed.

Mr. Thompson believes that belt speeds exceeding 600 f.p.m. can be used in mines. About 60 hp. is all an ordinary 30-in. belt can absorb while operating at 400 f.p.m., he has found, and while 4-ply belts have been found satisfactory for handling coal only, 5-ply are preferable if supplies are to be handled by the belt. The protective features of the complete system of electrical controls in Bolair No. 1 mine is saving 24 to 26 man-shifts by elimination of men at the transfer stations. Separator control boards employed provide that if a belt anywhere in the system is stopped all outbye belts can be started and if the power goes off all belts restart in sequence from the outside in.

Cleanliness is a must in operation of belts, Mr. Thompson said. Individual belt-conveyors are greased in relation to their speeds and wattmeter charts are found helpful in warning of bad operating conditions and faulty lubrication.

In making splices, diagonal cuts at 20 deg. were tried but results were doubtful. If a belt is worn along the edges it may be necessary to establish a center line to make a square cut. Where one belt discharges at right angles to another Pardee & Curtin is adopting a 90-deg. chute arrangement with screen and impact idlers. The faster depreciation of belts must be compensated for by other savings, Mr. Thompson said.

Experience with belts in 22- to 40-in. coal (average 36 in.) was discussed by W. A. Haslam, superintendent, Mingo County mines, Island Creek Coal Co. He agreed that belts are a safe method of transportation but believes that other types of mining can be equally safe. Low coal adds some hazards to belt operation not



G. R. Spindler (left), Joseph Pursglove Jr., J. J. Foster, R. H. Morris, Jesse Redyard and J. D. A. Morrow



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Yes, it will be very new and very revolutionary. But one

thing could not be improved—the fuel. Like all Chesapeake and Ohio locomotives, it will burn COAL.

As always, you may rest assured that every ton of coal you ship via Chesapeake and Ohio will be hauled by a COAL-burning locomotive.

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encountered in high coal. For thin seams, Mr. Haslam stated, belt transportation has proved to be the most economical. Beyond a certain distance, however, mine cars should be used unless grades are too steep. For individual belts, 2,500 to 3,000 ft. is the practical limit of length.

Mr. Haslam cautioned against selecting belt conveyor equipment that is heavier than necessary to do the job, because of the importance of economical moving and lay-up. Experience with sealed-for-life bearings "has not been too good," he said. The first belts purchased were 4-ply 42-oz. units. Cord belts next purchased showed superior toughness so more of that type were installed. Comparative tests made with 5-ply 28-oz. and 3-ply 48-oz. belts showed about the same toughness as the cord.

Belts reverse-operated for carrying supplies must be run at greater tension than if run only one way. Covers 1/32 in. thick on the under side were found to wear out in four years and allowed the belts to rot. A new method of splicing that is proving worthwhile includes using the new hinged plate and cutting the belt by template on a curve. That type of cut allows the center to take the same tension as the edges, thus making the belt train better. Training a new belt properly is highly important because one run with a strain while the belt is new maintains that shape during life.

To increase safety for men riding belts, a system by which a man on the belt can stop it from any point is being investigated. Mr. Haslam concluded his discussion with the observation that a few years from now the majority of coal operations will be belt mines.

Overfire jets to eliminate smoke from locomotives and boiler plants (at least 1,000 locomotives of 27 railroads and more than 1,000 plants in Chicago alone are so equipped), the smokeless stove, the manufacture of which has now begun, and inverted underfeed stokers with automatic ash removal that have undergone successful tests, were cited by T. A. Day, Bituminous Coal Research, Inc., as some of the recent accomplishments of that organiza-

### NEW OFFICERS WEST VIRGINIA COAL MINING INSTITUTE

**President:** J. J. Foster, general manager, Island Creek Coal Co., Holden, W. Va.

**Vice presidents:** R. H. Morris, vice president, Gauley Mountain Coal Co., Ansted; Jesse Redyard, general manager, Redyard Coal Co., Pineville; George R. Higinbotham, vice president, Consolidation Coal Co. of West Virginia, Fairmont; William Beury, president, Algoma Coal & Coke Co., Algoma; and J. F. Trotter, vice president in charge of operations, Davis-Wilson Coal Co., Morgantown.

**Executive board:** C. W. Connor, general manager, mining division, American Rolling Mill Co., Montcoal; W. G. Crichton, mining engineer and vice president in charge of sales, Johnstown Coal & Coke Co., Charleston; T. E. Johnson, secretary-treasurer, Northern West Virginia Coal Operators' Association, Fairmont; John T. Sydnor, president and general manager, Rail & River Coal Co., Wheeling; Lawrence E. Tierney Jr., president, Eastern Coal Corp., Bluefield; and Joseph Pursglove Jr., president, Pursglove Coal Mining Co., Morgantown.

**Secretary-treasurer:** G. R. Spindler, head, W. Va. Department of Mines, Charleston.

13½ months from an average yearly expenditure of \$12,615 between 1933 and 1940.

Mr. Day called attention to the bituminous industry's performance of a miracle in producing what was considered an impossible tonnage during the difficult circumstances of World War II. The daily production per worker is now 5.6 tons as compared to only 2.8 tons during World War I. Improved methods through machinery and efficiency, plus the latent capacity necessary for seasonal demands, were responsible for the accomplishment, he said.

Mr. Day pointed out that the U. S. reserves of coal are 225 times greater than the combined reserves of natural gas and petroleum. If natural gas were substituted for our present coal consumption and used at the same efficiency, the supply would last only 7 2/3 years.

R. B. Williamson, Eastern Coal Sales Corp., and a member of the technical advisory board of B.C.R., in discussion offered an opinion that the inverted underfeed stoker is doing an excellent job of solving the problems of coking and removing ash automatically. He said that with the additional money now available B.C.R. work is progressing much more rapidly than in the past. In his opinion, the research on complete gasification of coal, which at first seemed to offer definite possibilities, proved a blind alley.

In a paper presenting, as he stressed, his own personal viewpoint on the so-called welfare fund as an average American citizen, John D. Battle, executive secretary, National Coal Association, said: "An act of extreme folly—one of the most astonishing occurrences in history—a royalty tax imposed without consent of the American people who must pay it—special privilege at its worst—where would this end if allowed to gain momentum—this thing violates the basic principles of trust."

Speaking of his hope that the approaching Congress will devise corrective measures, Mr. Battle said, "One of our country's chief and immediate needs is con-

tion. In his paper, "West Virginia's Contribution to Coal Research," he said that 67 industry-conscious producers in the State are now members of B.C.R. Of the total bituminous production of the United States, producers of 226,000,000 tons annually are underwriting this research. Contributions from railroads and others is equivalent to another 20,000,000 tons. The B.C.R. research program has grown to \$401,000 for the current budget period of

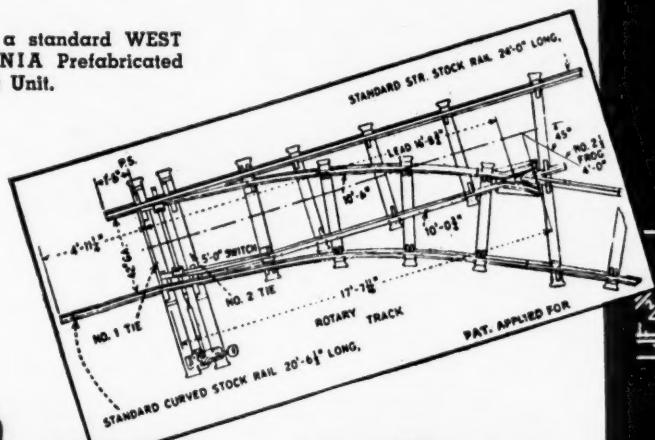


Ivan A. Given (left), Julian W. Feiss, Dr. Irvin Stewart, J. J. Foster, Joseph Pursglove Jr., J. D. Battle, J. D. A. Morrow, C. W. Thompson, G. R. Spindler, W. A. Haslam, T. A. Day, R. H. Morris and Jesse Redyard

At right, a mine layout such as can be planned by you on paper, produced in standard sections by WEST VIRGINIA and delivered to you ready to be laid. The only track tools you'll need are a wrench, a hammer and a blueprint!

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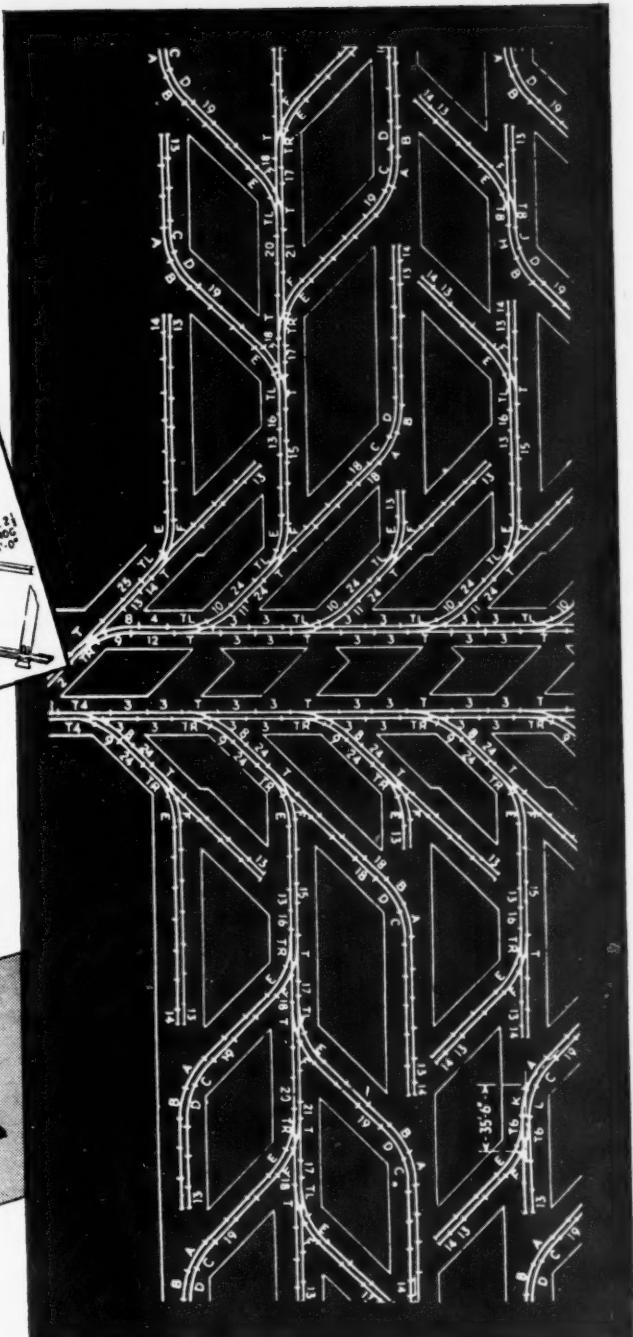
track

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## **WEST VIRGINIA**

structive labor legislation. What is needed, to quote from the Washington Post of Nov. 9, is 'an act that will foster genuine collective bargaining in place of collective bludgeoning'."

Ivan A. Given, editor, Coal Age, leading the discussion, suggested these conclusions: (1) the health and welfare fund was conceived in duplicity; (2) it was bullied through by force and by fiat in an attempt by government officials to appease Lewis; (3) if the principle is established and Lewis gets sole control over the fund, there is no limit on how far he can go; (4) it is another example of attempts to place dominion over industry, employers and the individual in the hands of a few men ambitious for power; and (5) it attacks from still another angle the fundamental principle that freedom lies in the responsibility of the individual for his own fortunes.

Among the resolutions adopted by the Institute was a request that Congress and the State Legislature of West Virginia enact, "a fair and just set of rules for the government of relations between employers and employees in the promulgation of honest collective bargaining that will preserve the rights and privileges of both, eliminate the numerous arbitrary and capricious injustices of the Wagner Act, and require business and labor to play the game under fair rules that do not extend unfair advantages to either side, with the primary aim of protecting the public."

Speaking at the dinner, Dr. Irvin Stewart, president of West Virginia University, stressed the need for closer cooperation between industry and the University, and especially referred to the coal and chemical industries. Of the 2,600 freshmen now enrolled in the University, 110 are in the School of Mines, he stated.

had to be reasonable and practicable, took into account the diversified natural conditions under which coal mining is done, and allowance had to be made for time in the conversion of procedures and equipment to conform to the standards set by the code. The federal inspectors are charged solely with the inspection of the mines and the reporting of violations to the Administrator.

Among the salient features of the 15-article code is a requirement that minimum standards of timbering be adopted at each mine, including the setting of temporary safety posts, jacks or crossbars close to the face before other mining operations are started, when necessary. It requires that workmen know how to test roof, ribs and face and that they make such tests before work is started and frequently thereafter.

Mine fans must be installed on the surface in fireproof housings and offset not less than 15 ft. from the nearest side of the mine opening and be equipped with fireproof air ducts and pressure-relief or explosion doors. The use of booster fans may be continued but the code discourages any new installation. Auxiliary or blower fans may be used to ventilate shaft and slope-sinking and their underground connections and the faces of rock tunnels. Split system of ventilation must be used wherever necessary to ventilate all parts of the mine effectively, and the maximum number of men on a split must conform to the requirements of the law of the State in which the mine is situated. Not less than 6,000 c.f.m. must be circulated in the last open crosscut in entries, and in entries leading to the pillar lines, not less than 6,000 c.f.m. must be delivered to the intake ends of the pillar lines. The air must contain at least 19.5 percent oxygen and not more than 0.5 percent carbon dioxide. If the air from a split contains more than 1.0 percent methane the ventilation must be improved. If it contains 1.5 percent methane the employees shall be withdrawn and power cut off from that section. Doors used on main-entry

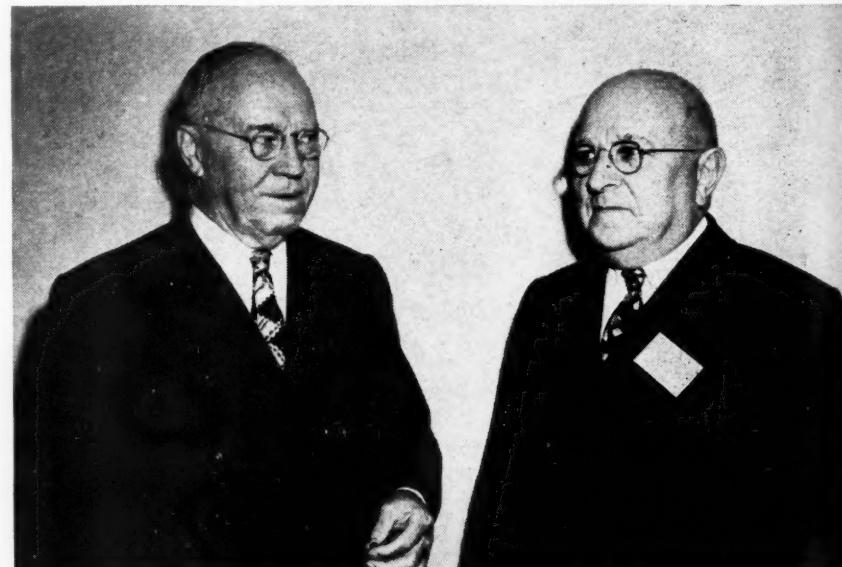
## Safety Code, Electric Locomotives Topics at Illinois Institute Meeting

The coal mine safety code and the development of the electric locomotive were among the subjects discussed at the 54th annual meeting of the Illinois Mining Institute at the Hotel Abraham Lincoln, Springfield, Ill., Nov. 15. Registration for the one-day meeting was 578. Robert M. Medill, director, Illinois Department of Mines and Minerals, succeeded Joseph E. Hitt as president.

In discussing the topic, "The U in Business," at the annual dinner, Kenneth McFarland, guest speaker from Topeka, Kan., reminded his audience that personnel always begins with a person. Skill and "Know How," he continued, are always essential to the satisfactory performance of any job, but in listing the reasons why people are fired from jobs they appear at the bottom of the list. The real troubles are personal ones. One of the best remedies for promoting a better understanding between management and workers, he said, is the free use of the timely and inexpensive word of appreciation in exchange for a job well done. He mentioned that workers don't like to be known by numbers—they like to hear their names called out.

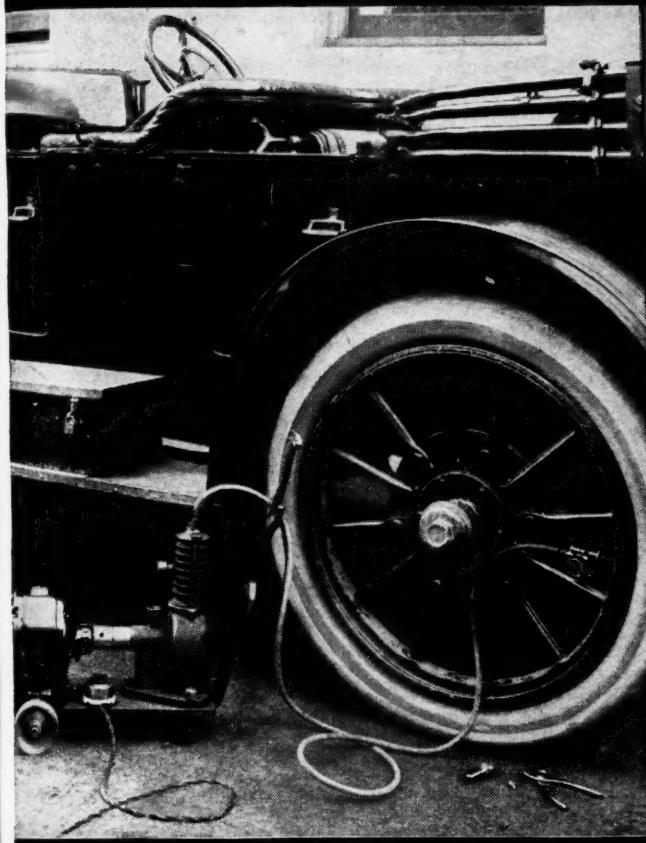
Prof. Harold L. Walker, head of the Mining Department, University of Illinois, presided over the morning technical session. The first paper, "Procedures of the Bureau of Mines Under The Federal Mine Safety Code for Bituminous-Coal and Lignite Mines of The United States," by M. J. Ankeny, coal mine inspector, U. S. Bureau of Mines, was read by Alex Miller, Mt. Hope (W. Va.) station. This new concept of the promotion of safety in coal mining, Mr. Ankeny said, might be regarded as "safety regulation by contract" and is intended to supplement safety regulation by State statute. It calls for the issuance of a reasonable code of standards and rules flexible enough to be applicable to all the coal-mine conditions encountered

in the United States and for the inspection of mines by coal-mine inspectors of the Federal Government for the purpose of finding and reporting upon lack of compliance with the code. It places upon management as well as workers a definite responsibility to comply with the code. It authorizes safety committees of miners to inspect mines and to report unsafe conditions to the management, thus placing upon labor some of the responsibility for safety that was formerly held to be chiefly that of management. It authorizes safety committees to recommend to the management the removal of workmen from places of imminent danger and requires management to carry out such reasonable recommendations as the committee may suggest. The preparation of a code, which



Robert M. Medill (left), newly elected president, and B. E. Schonthal, secretary-treasurer, of the Illinois Mining Institute.

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and cross-entry haulage roads must be erected in pairs unless the doors are attended.

One of the most progressive requirements of the code is the provision that all mines, whether gas has been discovered therein or not, must be examined for gas and other dangers by fire bosses or mine examiners not more than four hours before the first shift enters the mine. In multiple-shift operations, examinations for the second and third shifts may be made by any certified official or other competent person designated by the mine foreman or mine manager. In mines in which methane has not been found, a preshift examination need be made only before the first shift enters and need not be repeated for subsequent shifts.

All mines, except those that are too wet or in which the dust is too high in combustible content to propagate an explosion, must be rock dusted to within 80 ft. of the faces of rooms and entries. Bag barriers may be used in lieu of generalized rock dusting in trackless entries and air courses, if placed as described in B. M. Report No. 3411. All haulage entries must have at least 24 in. clearance from the farthest projection of moving equipment. Shelter holes must be provided every 80 ft. where locomotive, rope, animal or shuttle-car haulage is used. The code calls for bonding both rails, crossbonding and for ties with the negative or return feeders at least every 1,000 ft. on main-line track. All new electric face equipment such as cutting machines, loading machines, drills, conveyors, and junction boxes for making multiple power connections, purchased for mines in which 0.25 percent or more methane has been found, must be of a permissible type. Electrically driven equipment, whether permissible or non-permissible, must not be taken into or operated in a working place where 1.0 percent or more methane can be detected in the general air of the place.

In concluding, Mr. Ankeny said, it is recognized that a large segment of the industry has inherited too many unfavorable safety conditions because of ill-advised engineering practices and lack of safety planning to make possible immediate drastic changes in present practices and conditions without disrupting the economic structure of the business. In many cases, too much has been taken out of the mines and too little in the way of safety improvement has been put back in. However, Federal reports so far indicate that compliance is being secured and progress is being made.

Explosion hazards are usually fairly well understood, said John E. Jones, safety engineer, Old Ben Coal Corp., in discussing the paper. It is the application of that knowledge that is too frequently omitted. Better application of safety knowledge in examination and ventilation in all the coal mines is the prime motive of the Code. There is need of more practical rock-dusting knowledge and especially in bituminous and lignite mines.

Referring to the tests to be carried on by the Bureau at its experimental mine, Mr. Jones declared, the tests should be continued to establish the amount of rock-dust required, where necessary, and the

## 1946-47 Officers Illinois Mining Institute

**President:** Robert M. Medill, director, Department of Mines & Minerals, Springfield, Ill.

**Vice President:** Harry M. Moses, president, H. C. Frick Coal Co., Pittsburgh, Pa.

**Secretary-treasurer:** B. E. Schonthal, Chicago, Ill.

**Executive board:** Newly elected—T. J. Thomas, Valier Coal Co., Chicago; Richard Baldwin, president, Midwest-Radiant Corp., St. Louis; A. H. Trux, president, Trux-Traer Coal Co., Chicago; L. A. Wasson, Wasson Coal Co., Harrisburg, Ill. Members of the executive board continuing from previous years—R. L. Adams, Old Ben Coal Corp., West Frankfort, Ill.; Alex Duncan, Superior Coal Co., Gillespie, Ill.; G. S. Jenkins, Consolidated Coal Co. of St. Louis, St. Louis, Mo.; E. R. Keeler, Franklin County Coal Corp., Chicago; J. W. Starks, Peabody Coal Co., Taylorville, Ill.; E. F. Stevens, Pyramid Coal Corp., St. Louis, Mo.; H. A. Treadwell, Chicago, Wilmington & Franklin Coal Co., Chicago; and W. P. Young, Bell & Zoller Coal & Mining Co., Chicago.

best means of application in typical mining fields, using their own coal dust and, as closely as possible, their own mining conditions. Ample rock dusting for safety is unanimously agreed among all mining employees and management.

In conclusion, said Mr. Jones, it is gratifying that a Safety Code was prepared that is practical while covering such a wide variety of mining conditions for that massive area and which was adopted with no loss of tonnage—and adding, as stated by the author, "a new concept in the promotion of safety in coal mining."

The paper, "Belgian and German Coal Mining During the European Campaign," by Dr. Louis C. McCabe, chief, Coal Division, U. S. Bureau of Mines, Washington, D. C., was illustrated with many photographs, some of which were in color. Dr. McCabe said the miners were allotted 2½ oz. of meat per day. Those working underground were given twice as much as the surface worker, and an extra day's ration was awarded to those working the six days of the week.

Frank Eubanks, superintendent of maintenance, Old Ben Coal Corp., had charge of the afternoon technical session. John S. Beltz, chief engineer, mining department, The Jeffrey Mfg. Co., traced the changes in locomotive design in a paper entitled, "Development of Electric Locomotives for Use in Coal Mines." The first electric locomotive used in a coal mine in this country was built and installed in an anthracite colliery owned by the Pennsylvania R. R. in 1887. The first one built by Jeffrey, and delivered to the Upson Coal Co. in 1888, was a single-motor job, gear driven throughout. All the early units used one rather high speed motor, which was connected to the axles through double-reduction gearing. Also, the single mo-

tor used idler or reach gears to drive both axles and this construction practically eliminated the use of springs and floating journal boxes as they are known today.

In 1885 Frank J. Sprague of New York patented a traction device in which one side of a motor was hung directly on an axle and the other side suspended from the truck frame by a suitable suspension nose. The armature was connected to the axle through a single reduction spur gear. By using a motor on each axle, power was applied to each set of wheels. Since it was no longer necessary to maintain fixed center distances between axles, spring-mounted journal boxes could be used. This made a better riding locomotive. The locomotive was able to follow uneven track much better since the axles were not rigid in the frame. By 1900, locomotive design had these features: cast-iron side frames, single-reduction spur gearing with motors hung directly on the axle and magnetic blowout drum controllers.

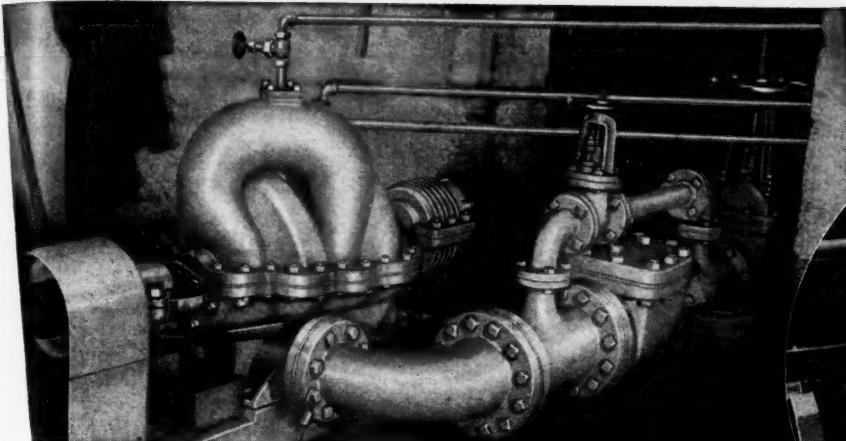
In the early 1900's a rack rail locomotive was resorted to to increase the draw-bar pull of light locomotives operating on grades. However, the idea was soon abandoned because it was too easy to overload the electrical equipment and numerous burnouts resulted. The locomotive was deprived of the only safety device that really works to prevent overloading—that of slipping the wheels.

Storage-battery locomotives, declared Mr. Beltz, were extremely popular for gathering service from 1912 to 1924. But with the introduction of rubber-clad cable with a tough, long-life jacket and improved cable reels the cable-reel locomotive seemed to regain its popularity. Also the use of mechanical loading, larger and heavier cars, and work in lower seams tended to give the cable-reel locomotive an advantage in many instances.

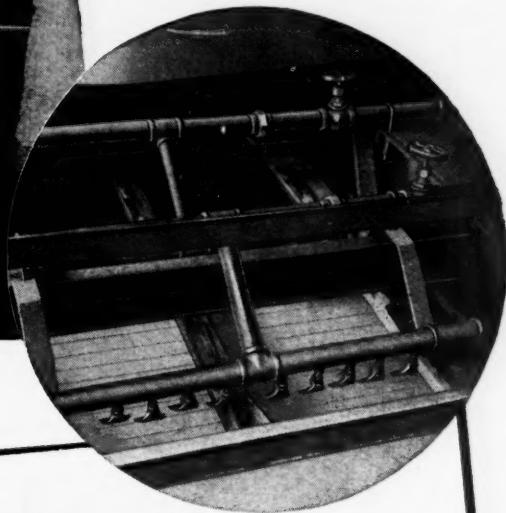
The introduction of ball bearings on locomotive motors was one of the most important advances in motor design, said Mr. Beltz. Ball bearings require less lubrication and last longer than sleeve bearings. Since the ball bearings did not require as much axial length as the bushed bearing the designer was able to install larger motors in the same minimum gage.

The adoption of contactor control to the larger mine locomotives was one of the important refinements made in locomotive design in the period between 1920 and 1930. The space required for this additional equipment and the extreme variations in mine voltage were obstacles which prevented the earlier use of contactor control. However, the development of contactors that would operate satisfactorily over a wide range in voltage plus the use of longer and wider locomotives made the installation of contactor control possible. This type of control paved the way for larger and faster locomotives. Speeds range up to 10 and 12 m.p.h., with loading per axle as high as 12 tons. The sliding shoe for current collection from the trolley, said Mr. Beltz, proved to be the most satisfactory means and is generally used on all large high-speed locomotives. He cited the case of a 40-ton unit which takes 2,000 amp. from a 250-volt trolley when developing its rated draw-bar pull at 11 m.p.h. He said the conventional trolley wheel was not

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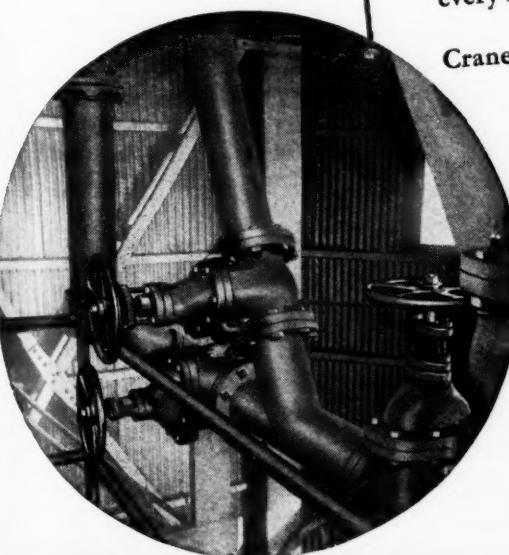
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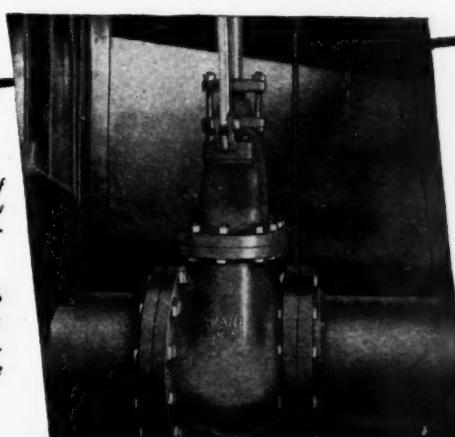
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CIRCULATING WATER LINE showing 12-in. Crane lever-operated Iron Body Gate Valve with extension stem.



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suitable for such loads and speeds.

Still another refinement was the use of anti-friction bearings on journals and suspension bearings. In the case of journal bearings, the main advantage is not the slight reduction in rolling friction but the longer life inherent in this type of bearing. The suspension bearing is the bearing by which the motor is supported on the axle. The main advantage to be gained by this construction is the longer life of the anti-friction bearing and the fact that the gear centers are accurately maintained with a consequent increased pinion and gear life. Improvements have been made in the bushed-bearing suspension construction so that the bearing surface is completely inclosed and the ends of the linings are made with labyrinth seals. This labyrinth seal can be packed with grease which prevents the entrance of sand and brake-shoe dust. This construction greatly increased the life of the axle linings as compared to the old open oil-lubricated type.

In summarizing, Mr. Beltz said, the basic haulage locomotive of today has two single reduction spur gear motors with Class B insulation and arranged for forced ventilation. All bearings are anti-friction arranged for gun lubrication. The locomotive will have contactor control and be equipped with steel strip resistors. It also will have power brakes and fully equalized spring suspension.

The final paper of the technical session was on the "Use of Churn Drills for Drilling Overburden at Strip Mines," by G. H. Kilpatrick, drilling and blasting superintendent, Fidelity mine, The United Electric Coal Cos. It was a resume of his experience with overburden drills all the way back to the one-cylinder Cyclone drill where it was necessary to set deadmen and to use a double block and line to move the drill from one location to the next. His next experience was with six Loomis drills with 4-cylinder gas engines and equipped with crawlers on the rear.

The next lot of drills were six Armstrong No. 29's. They had 10-ft. crawlers with 14-in. treads and were powered with 15-hp. electric motors. Wire lines were used for drill cables and the machines had all-steel frames. For the first five years, the drills were used for drilling 6-in. holes. Then they were equipped for 9-in. work. The purchase of 16-ft.-long 6-in. drill stems and 9-in.-diameter bits provided more weight for drilling the hard rock strata at Fidelity.

Since 1939, Mr. Kilpatrick has been working with Bucyrus 42-T churn drills with all-steel frames and 57-ft. telescoping derricks. The crawlers are 14-ft. long and have 36-in. treads. A 40-hp. electric motor handles a 33-ft. drill stem with a 5-ft. drill bit (for 9-in. work) or a total weight of approximately 4,000 lb. in drill tools alone. Screw jacks formerly were used for steadyng the drills while the holes were being drilled. But as the machine was never solid on these jacks it was impossible to get a perfect blow on the rock. Now, Bucyrus-Erie-built hydraulic jacks are used for leveling the machine and for keeping it solid during the drilling operation. Adjustable stem guides, advantageous for drilling different depth holes, is another feature added to this drill.

## A.I.M.E. Anthracite Section Discusses Deep-Well Type Pumps

A technical paper on the "Application of Vertical (Deep-Well Type) Pumps in the Anthracite Industry," presented by L. D. Lamont of The Philadelphia & Reading Coal & Iron Co., highlighted the annual fall meeting of the Anthracite Section of the A.I.M.E. in Pottsville, Pa., Nov. 8. Messrs. F. E. Kudlich, Jeddo-Highland Coal Co., R. A. Lambert, Pennsylvania Coal Co., and W. C. Petzold, The Hudson Coal Co., collaborated with Mr. Lamont in the preparation of the paper. During the dinner the group numbering over 200 was entertained by the Anthracite Octet of Lansford, Pa. W. C. Muehlhof, chief engineer of the P. & R. C. & I. Co., was chairman of the meeting.

Of the 30 deep-well-type pumps operating in the anthracite region, Mr. Lamont said, 21 are oil-lubricated and nine are water-lubricated. The former require four to six drops of oil per minute per 100 ft. of depth. Most of the motors driving the pumps are direct-connected. Others are geared or V-belted.

The first deep-well pumps were installed at the Powderly shaft of The Hudson Coal Co. and the Erie shaft of the Pennsylvania Coal Co. to dewater two collieries flooded by the same body of water. Since then, other installations have been made in which capacities varied from 600 to 5,600 g.p.m., with heads ranging from 100 to 500 ft. and motors of 50 to 700 hp. Speeds range from 735 to 1,800 r.p.m. Most of the installations fall in the 1,800 range. All of the P. & R. C. & I. Co.'s installations are in the 1,200-r.p.m. class. Power consumption amounts to 5 kwh. per million foot gallons.

The column pipes are lined with rubber, lead or enamel. After the priming coat, the enamel, declared Mr. Lamont, should be applied in warm weather at 450 to 480 deg. F. To protect the enamel, a 4-in. coating of Bitumastic is applied hot. Inside the column pipe, a sectional, stainless-steel tubing extends from the motor at the top, or discharge-end, of the pump to the

impeller at the bottom, or intake-end, of the unit.

A horizontal motor was used in place of a standard vertical one in a recent installation of a deep-well pump at the St. Clair Coal Co. This 3,000-gal. pump, working against a 200-ft. head, has two discharge pipes with a drive shaft mounted between them. A horizontal motor (mounted in the vertical position) was tried because of a long delivery date on the vertical type. A 200-hp., 1,800-r.p.m., 2,200-volt, totally-inclosed, fan-cooled, ball-bearing type motor was used, and the installation, Mr. Lamont reported, is working quite satisfactorily and has the motor manufacturer's approval.

In the event of power failure, this type of pump, through the means of a pawl and ratchet, must be prevented from rotating backwards while the water is draining back or a time delay must be incorporated in the starter which will allow sufficient time for the column pipe to be drained.

The modified I.S.A. orifice with a free discharge (available from Barrett Haentjens & Co.) is a handy means of determining the pump's efficiency, said Mr. Lamont. It measures the pressure behind the orifice in feet and tenths.

In the summary, Mr. Lamont listed some of the advantages and disadvantages of deep-well pumps. The chief advantages were: (1) small area required; (2) controls are away from the water; (3) needs no priming as long as bowl is in water; (4) as the water raises, the pump can handle more water without endangering the motor; (5) underground power lines are costly and are not needed for this type of installation; and (5) sealed pump rooms need not be constructed.

Some of the disadvantages of the deep-well pumps are: (1) inaccessibility for examination; (2) inability to use go-devils to clean the lines; (3) time and expense for removing and replacing for examination; and (4) the amount of inventory as compared with horizontal pumps.



H. W. Montz (left), Lehigh Valley Coal Co., and L. D. Lamont and W. C. Muehlhof, The Philadelphia & Reading Coal & Iron Co.

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## Central Appalachian A.I.M.E. Meeting Discusses Timbering and Grounding

Pin supports for safety crossbars over mobile-loading machines, metal spuds driven into the coal roof for supporting brattice cloth and arguments against grounding certain mining machinery were highlights of the operating problems discussed at the annual meeting of the Central Appalachian Section, A.I.M.E., held at Fairmont, W. Va., Nov. 8-9. Other subjects included "Coal, Sinners and the Work of the B.C.I." high-nickel alloys, coking coals of the Northern West Virginia area and coal derivatives.

A. S. Shoffstall, consultant, International Nickel Co., Huntington, W. Va., presided over the two-day meeting as section chairman. Technical session chairmen were: G. R. Spindler, chief, Department of Mines, Charleston, W. Va.; George R. Higinbotham, vice president, Consolidation Coal Co. of West Virginia, Fairmont; A. R. Matthews, presi-

dent, Clinchfield Coal Corp., Dante, Va.; and John T. Parker, superintendent, Wheelwright mine, Inland Steel Co., Wheelwright, Ky.

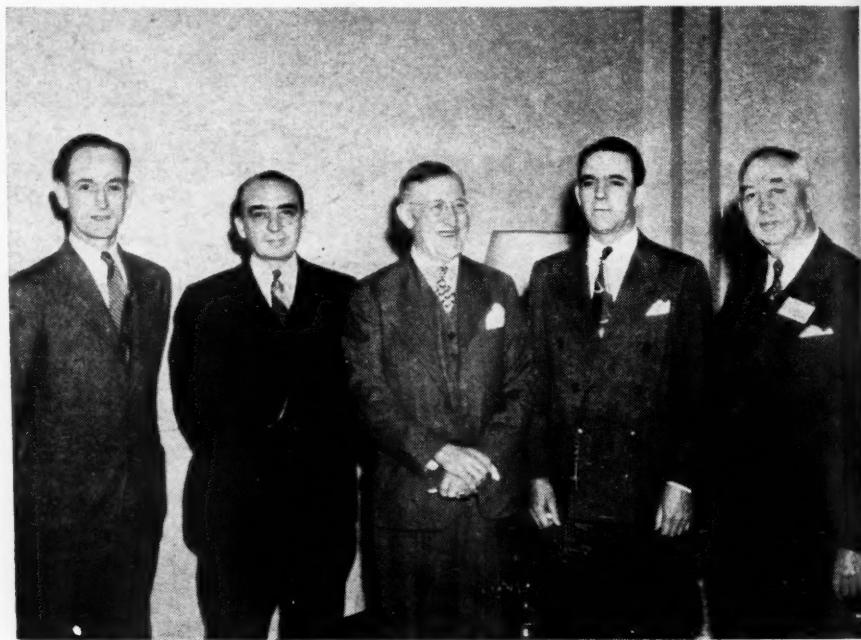
J. A. Hagy, superintendent, Jewell Ridge Coal Corp., Jewell Ridge, Va., was elected chairman of the section for the coming year. James Hyslop, vice president, Hanna Coal Co., St. Clairsville, Ohio, was the speaker at the dinner meeting, discussing "The Basis of Freedom." He called attention to the many paternalistic fashions the world over that have led to restricted freedom or actual slavery. To maintain freedom requires good morals but morals, however, cannot be legislated into people. Protection, he said, must rest on the right ideology and that right type, which recognizes the dignity of the individual.



J. A. Hagy, chairman-elect of the Central Appalachian Section.



James Hyslop, vice president, operations, Hanna Coal Co., speaking at the dinner.



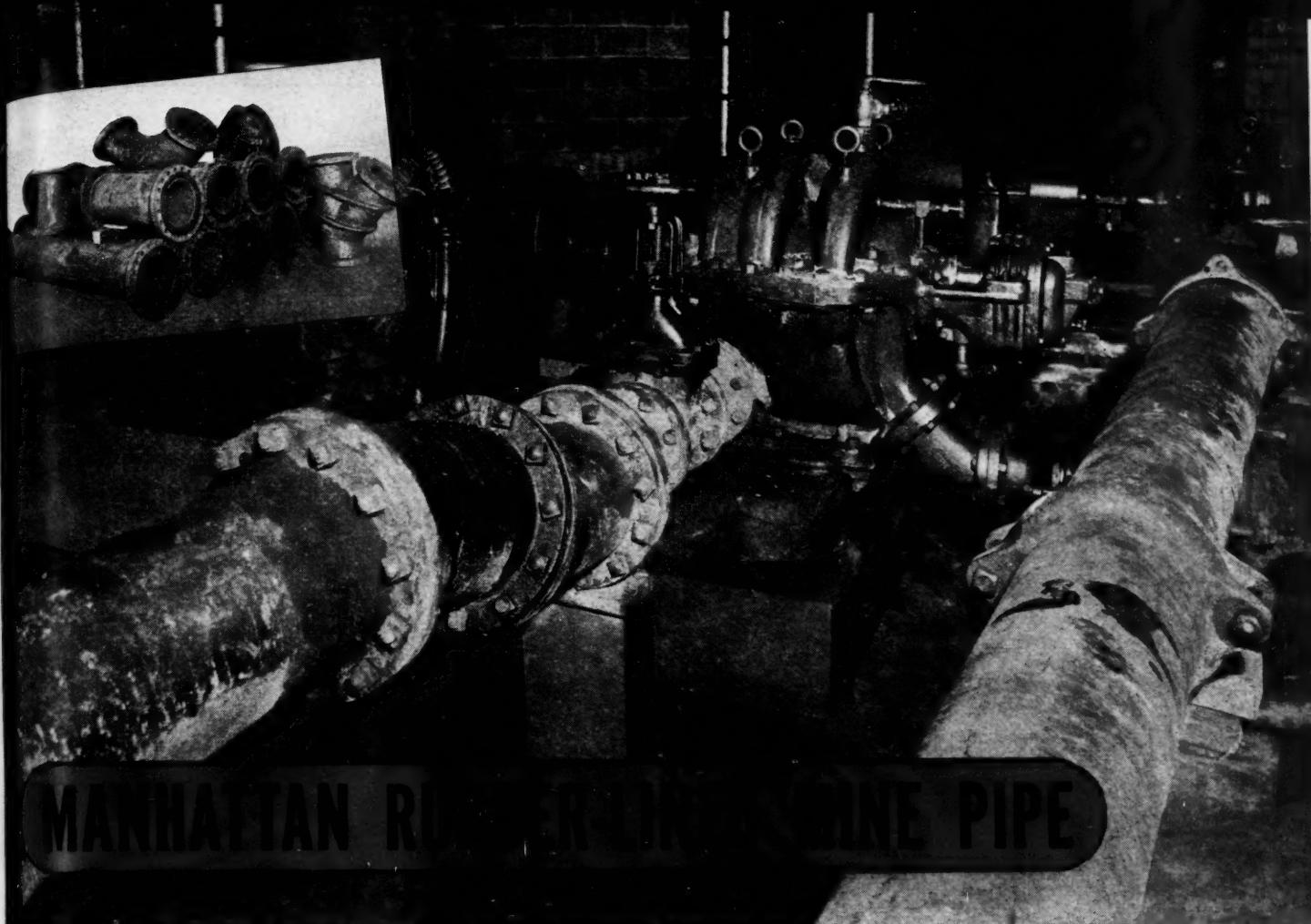
John T. Parker (left), Charles Russel, Howard P. Zeller, A. R. Matthews and A. S. Shoffstall.



Frank E. Miller (left), A. S. Shoffstall and George C. Barnes Jr.



Dr. W. A. Mudge (left) and George R. Higinbotham.



The perfectly—permanently—bonded Manhattan rubber lining in this pipe is taking a pressure of 185 psi from a head of 370 feet. It has shown no effects from water with 283 parts per million of free acid, nor from the abrasive action of 2,200 parts per million of solids (fire clay, coal, etc.). The bell-and-spigot line at right is not rubber-lined.

- 1. Carries acid mine water for years with no maintenance expense due to internal corrosion.**
- 2. Minimizes "sulfur mud" deposits inside pipe walls.**
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Manhattan can also supply rubber-lined check and gate valves, flexible rubber pipe, and rubber-covered pump parts for a complete protective job, and Mildew-Proofed Underground Conveyor Belts.

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The installations pictured here are in a bituminous mine. Manhattan Rubber-Lined Pipe on the intake and discharge lines fortifies this pumping station against shutdowns for pipe maintenance. Costly replacement of corroded iron pipe has been eliminated.

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Regardless of the character and content of water in mines, Manhattan can provide the proper rubber-lined protection for your pumping lines. Call a Manhattan engineer for a complete analysis.

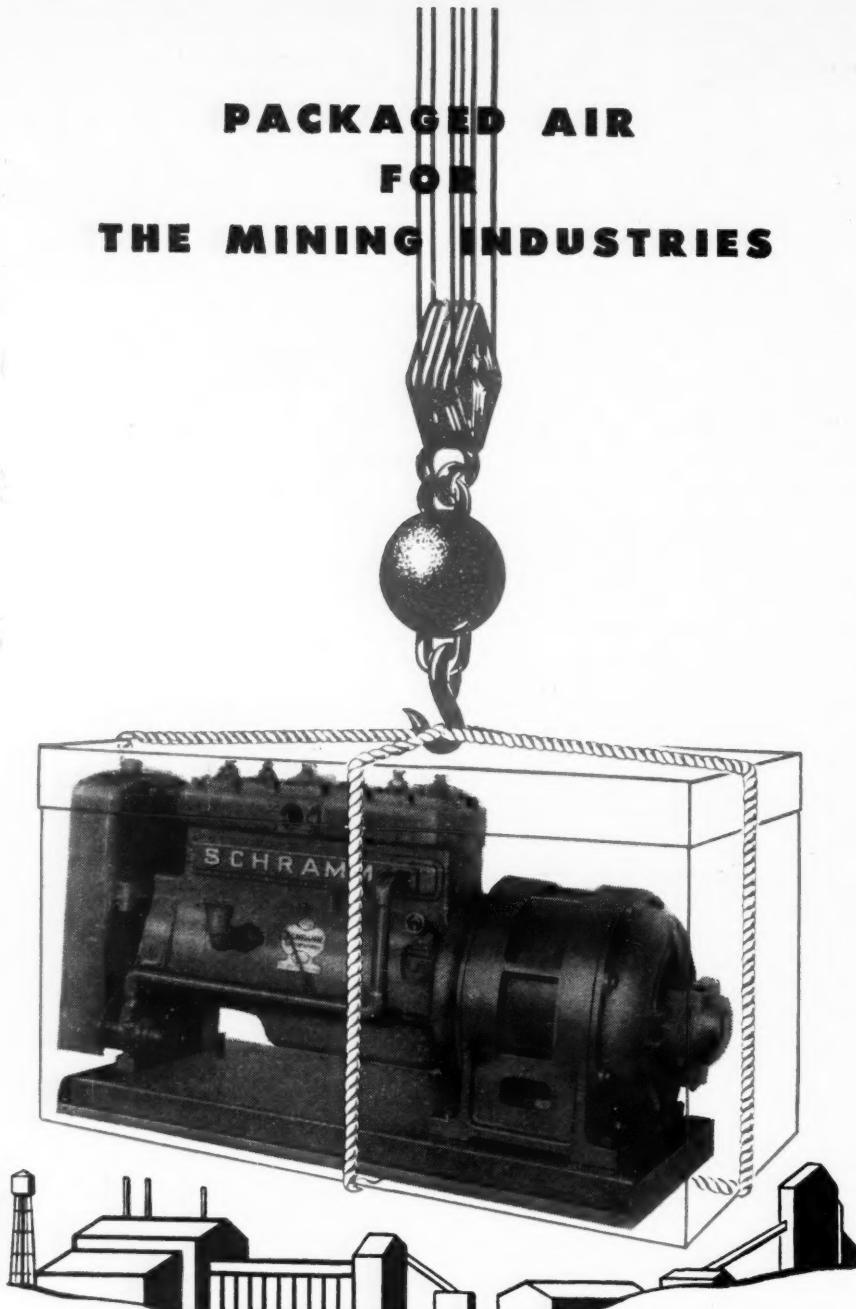
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## 1946-47 Officers Central Appalachian A.I.M.E.

Chairman, J. A. Hagy, superintendent, Jewell Ridge Coal Corp., Jewell Ridge, Va.; vice chairmen, C. E. Lawall, engineer of coal properties, coal department, C. & O. Ry., Huntington, W. Va., R. H. Allen, general manager, Well Service, Inc., Charleston, W. Va., and Louis W. Huber, district manager, Mine Safety Appliances Co., Lexington, Ky.; secretary-treasurer, Charles T. Holland, associate professor of mining engineering, West Virginia University, Morgantown, W. Va.

vidual and sanctity of human life, lies in the teachings of Christianity.

E. Frank Miller, general superintendent, Federal Division, Koppers Coal Division, Grant Town, W. Va., in a paper, "Safe Timbering of Working Places in Mobile Loading," illustrated with slides, described the pin timbering evolved for working places in the Pittsburgh seam where 8 to 10 in. of top coal is left to furnish beam strength to sustain the 3 to 4 ft. of frail and irregular bone, wild coal and draw slate. As a safety precaution, 14-ft. wooden crossbars are used over the mobile-loading machine and these are taken down in sets of two and moved forward.

Instead of the previous practice of supporting the crossbars on 7-ft. wooden posts, the bars are now supported on steel pins stuck into shallow holes drilled in the coal rib about 12 in. from the top. The holes are between 2 and 3 in. in diameter and are drilled by the regular blast-hole drilling crew with special short augers powered by the coal drills. Pins consist of 36-in. lengths of 30-lb. scrap rail with 18 in. at one end forged to a round section to go into the hole. A curved saddle is welded to the top side of the outside end of the pin to carry the crossbar, which is wedged to the top.

Safety through practically eliminating knocking down of posts by mine equipment is an outstanding advantage of the method. In addition, saving on the purchase of 7-ft. posts is \$75 to \$100 per day and to that can be added the saving in handling and transportation. With the use of scrap rail and having the work done in the mine blacksmith shop, pin cost is small and the pins are used over and over again. The present method was evolved from a beginning in 1944, using pins cut from 1½-in.-round common steel stock. Mr. Miller stated that when the pin work was started at Grant Town he had not heard of a similar application in any other coal mine.

Brattice cloth hung on metal spads driven into the coal roof was illustrated in one of the slides Mr. Miller used to show face timbering. He explained that this method, patented by J. T. Sembower, Baxter, W. Va., transitman at the mine, is saving labor and materials. The brattice cloth is pinned to the spad with a 6 or 8 penny nail and the spad is recovered and

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For top efficiency in your mine, specify "CZC"-treated wood—from roof timbers to haulageway ties. In the meantime, write for detailed information on this wood preservative that makes wood last longer. E. I. du Pont de Nemours & Co. (Inc.), Grasselli Chemicals Dept., Wilmington 98, Del.

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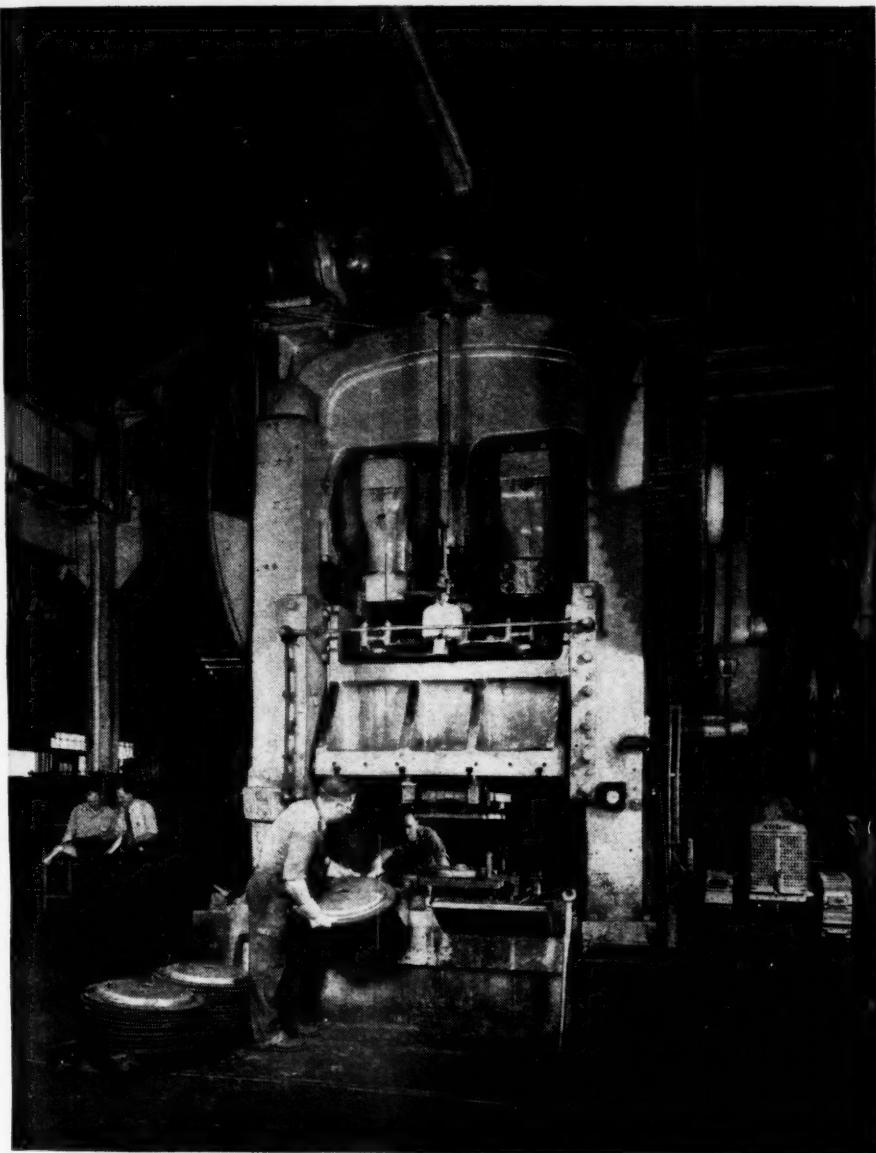
Mr. Miller's paper covered both theoretical and practical experience as an approach to handling the roof of the Pittsburgh seam, from which, he said, 90 percent of the production from Northern West Virginia is secured. In conclusion, he listed five points for preliminary analysis when developing a comprehensive plan for working place timbering: (1) columnar consist, (2) structural strength of coal seam, (3) beam strength of the strata composing the immediate roof, (4) portion of total overburden to be supported by the face timbering and duration of the support and (5) what center intervals between headings or rooms would be most advantageous to insure support of the roof without movement of the overburden.

George C. Barnes Jr., associate professor of electrical engineering, Virginia Polytechnic Institute, Blacksburg, in a paper, "Mine Safety and the Frame Ground," cited statistics of the Bureau of Mines to prove that electric arcs have been by far worse offenders, as compared with electric shocks, in producing fatal and non-fatal accidents directly and indirectly from electricity. He offered evidence that solid frame grounding of d.c. mining machinery (for instance by adding a third or ground conductor in a shortwall trailing cable) will produce a more dangerous condition.

Using a blackboard to display wiring diagrams, he pointed out that, (1) complete frame grounding increases danger of an insulation failure and also increases the fault current that will flow through an accidental ground; (2) complete frame grounding increases danger of a fault burning through the case of a permissible unit, thus increasing danger of a mine explosion; and (3), a complete frame ground increases the chance of severe shock, reduces the frequency of minor shocks and can be the cause of putting full voltage on the frame of every machine in a section if the main return circuit breaks.

Mr. Barnes stressed the point that fuses are highly unreliable as a means of limiting fault current to a face machine with a completely grounded frame and that even a circuit breaker, which is reliable, has limitations because, when set to carry the maximum load, it will not act if the fault current, which may be dangerously high, is still below the breaker setting. His suggestion, in place of the solid ground, is to connect a pair of neon glow lamps in parallel, these in series with a high resistance and then connect the series-parallel circuit between the machine frame and the grounded side of the power circuit, at the machine. Lamps burning indicate good insulation, while lamps dimming or going out indicate insulation needing attention.

Van B. Stith, general superintendent, Anchor Coal Co., agreeing with Mr. Barnes, said he believed that ungrounded frames were safer than those grounded by a third wire in the trailing cable as recommended by State and Federal inspectors. C. E. Hough, general superintendent, Mining Division, American Rolling Mill Co., said recent estimates showed an additional investment of about \$16,000 per section of 2,000-ft. belt and four conveyor units to



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**MINERS PREFER  
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- Over-sized Moly D Handle is comfortable to any hand regardless of size.

**THE WOOD**  
**SHOVEL AND TOOL CO., Piqua, Ohio**  
*A National Organization Specializing Exclusively in*  
**SHOVELS SPADES SCOOPS**

change that layout to third-wire grounding. That included new permissible connectors and other incidental items.

Further discussion of the problem included several favorable comments on protecting trailing cables by a shield over the live conductor, with this shield connected to the shunt trip of a circuit breaker thus making it impossible to have dangerous arcs in the cable. The article on this subject in Coal Age, October, 1946, p. 91, was referred to in the discussion.

Dr. W. A. Mudge, assistant director, technical service section, International Nickel Co., in his paper, "High Nickel Alloys, Their Manufacture, Properties and Uses," illustrated with a sound film showing mining, refining and milling of nickel and monel, stated that his company at peak production mines about 12,000,000 tons of ore per year. Nickel is used in approximately 3,800 of the 12,000 known alloys, and ratio of total consumptions of nickel and steel is approximately 1 pound to  $\frac{1}{2}$  ton he said. The coal industry uses many grades of steel containing nickel where toughness and corrosion-resisting qualities are important.

Howard P. Zeller, vice president, Jamison Coal & Coke Co., Greensburg, Pa., presented a paper on "Coking Coals of the Northern West Virginia Area, Their Supply, Preparation and Use." Because of the strenuous demand for coke and the diminishing reserves of low-ash Pittsburgh seam coal available outside of the captive mines and the consequent increase in the use of high-ash Pittsburgh coal for coking, he predicted much interest in the low-ash coals of Northern West Virginia (District 3) to blend with the Pittsburgh.

Mr. Zeller believes that the Sewell coal, although it expands when coked, will become quite popular in three-way mixtures. Through necessary mixing of available coals during the war much was learned about these three-way mixes, but most plants, however, are short of bins to handle several sizes. As a general rule, low-volatile coals expand and high-volatile coals contract in the ovens. Blast-furnace men used to think that good coke could not be made from low-ash coals but that has proven to be a fallacy. In addition to the Sewell coals, he discussed the Freeport, Kittanning, Tioga No. 5 Block, Fire Creek, Eagle and Peerless.

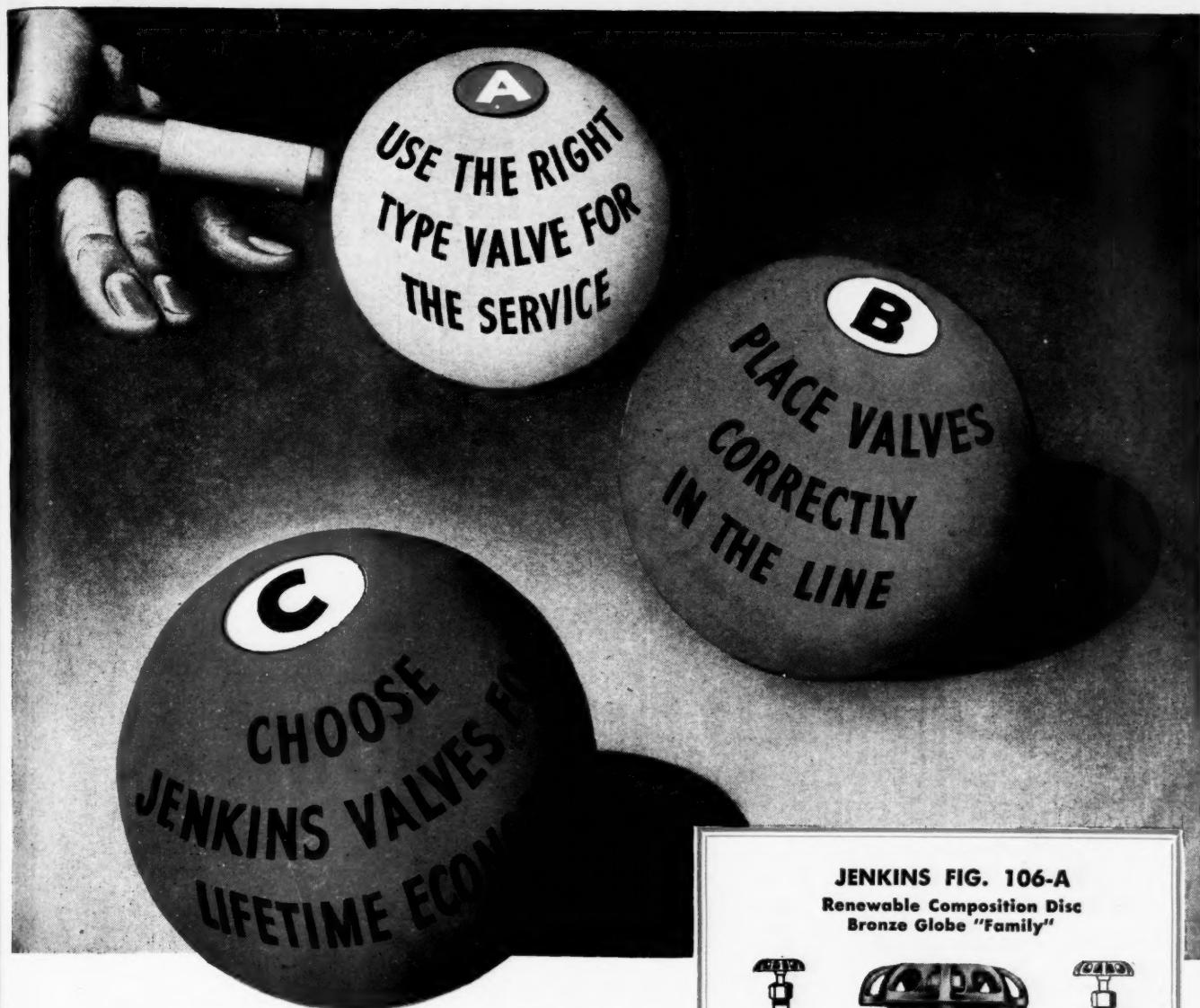
Although these coals from Northern West Virginia are low-ash, it is imperative, he said, that they be highly prepared to overcome the higher cost of production due to less favorable natural condition, as well as the higher freight rates.

Charles Russel, chemical engineer, research department, Koppers Co., Kearny, N. J., illustrated his talk on "Coal Derivatives" with a film showing complete operations at a byproduct plant. He explained that such a plant begins the unlocking of the coal and makes only five or six raw materials for other plants to process. During the war one-sixth of the bituminous coal was used in byproduct ovens. About 70 percent of the coal becomes coke and approximately 1,800 lb. of coke is used for each ton of pig iron produced. Other primary products are gas, 6 lb. of ammonia per ton of coal, somewhat less than 10 gal. of tar per ton, and 2 $\frac{1}{2}$  to 3 gal.

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## The right angle of approach to lower valve costs

Line-up your valve-buying sights on the Jenkins 3-Point Formula and score money-saving valve economies.

By specifying Jenkins Valves when new valves are needed, you get the product of valve specialists whose ability to build extra value into valves has been recognized for over 80 years. You also get the experienced assistance of Jenkins top-rated valve engineers on any question of selection or placement.

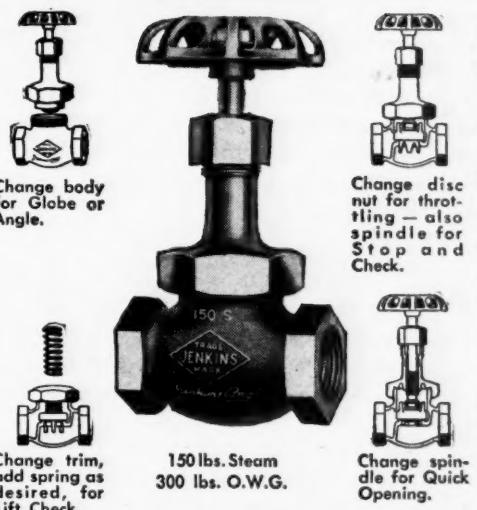
Base your valve buying on the 3-Point Formula and get extra value which means lowest cost in the long run.

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Renewable Composition Disc  
Bronze Globe "Family"

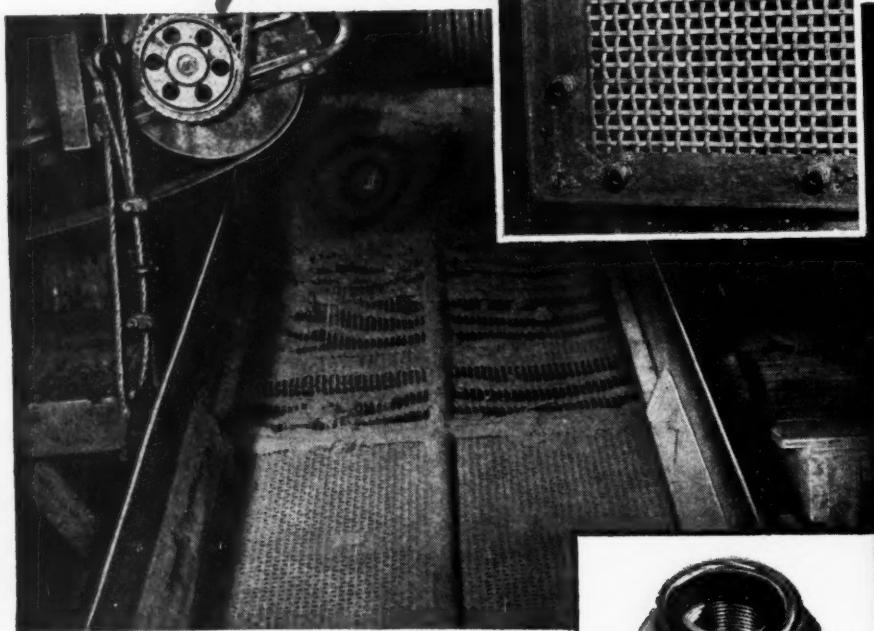


The Fig. 106-A "family" permits valve combinations for 90% of average needs through interchangeability of parts. With only four body types and a handful of parts, over 26 different types of valves can be assembled. Equipped with the slip-on stay-on disc holder, Fig. 106-A can be restored to good-as-new service in a few minutes.

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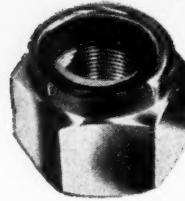


**The Red Elastic Collar locks fast against 1050 rpm screening VIBRATION**

Vibration-loosened fasteners were once a production problem in the cinder block plant of the Plasticrete Corporation at Hamden, Conn. The violent reciprocating action of the screens shook ordinary fasteners loose and permitted them to drop into the block moulds. Production was interrupted constantly to repair the damaged moulds.

ESNA Elastic Stop Nuts—with the self-locking, self-sealing Red Elastic Collar—were substituted. They held tight against Vibration. They protected the working threads against Moisture Penetration and Corrosion. They speeded maintenance because they were easily removed for worn screen replacement. And they were reusable without loss of self-locking, self-sealing effectiveness.

ESNA Elastic Stop Nuts are the *only* detachable fasteners used on Plasticrete's screens. This standardization achieves the double economy of inventory simplification and reduced procurement costs. For further information address: Elastic Stop Nut Corporation of America, Union, New Jersey. Sales Engineers and Distributors are conveniently located in many principal cities.



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It is threadless and permanently elastic. Every bolt—*regardless of commercial tolerances*—impresses (does not cut) its full thread contact in the Red Elastic Collar to fully grip the bolt threads. In addition, this threading action properly seats the metal threads—and eliminates all axial play between bolt and nut threads.

All ESNA Elastic Stop Nuts—*regardless of size or type*—lock in position anywhere on a bolt or stud. Vibration, impact or stress reversal cannot disturb prestressed or positioned settings.

of light oil scrubbed out of the gas.

About 60 percent of the sulphur in coal goes into the coke and about 40 percent into the gas. This sulphur must be eliminated from the gas before it goes into the mains. About one-third of the tar is burned in open-hearth furnaces of the steel companies. As the source of the benzene-ring compounds, coal is an important chemical raw material. Touching on the production of gasoline from coal, Mr. Russel said it takes about 4 tons of coal to produce a ton of gasoline.

Discussion of Mr. Russel's paper brought out the fact that dry quenching of coke is done at a Buffalo plant close to the center of the city and that the steam generated by heat exchangers from the quenching is used for heating buildings in the city. That scheme is not practical for ordinary plants producing power, however, as there is no steam when ovens are not being pulled.

Three young men are now in mining schools on scholarships of the Central Appalachian Section of the A.I.M.E. reported L. I. Cothorn, head, department of mining engineering, Virginia Polytechnic Institute and a member of the scholarship committee. These students are R. D. Richards, Blacksburg, Va., J. A. Harmar, Shimiston, W. Va., and R. A. Bradbury, Wheelwright, Ky. Although every high school in the section was notified of the impending scholarships only eight applicants appeared to compete for the three scholarships to be awarded.

Supplying school book authors with correct information on the coal industry has been an important accomplishment of the Bituminous Coal Institute, according to Dr. M. Edmund Speare, educational director, who spoke on "Coal, Sinners and the Work of the BCI." It has been determined that as many as 15,000,000 persons can be exposed to one issue of a geography and therefore an incorrect or biased statement in such a book can do incalculable damage. In his talk, delivered at the luncheon meeting, Dr. Speare outlined BCI's educational activities of the last three years, including advertising in periodicals, radio addresses, exhibits, movie films and platform speakers. As a preface, he summarized the findings of the National Opinion Research of two years ago, which showed a very large amount of bias and ignorance of the facts in relation to the coal industry in that group who had only a grammar or elementary school education.

## Court Rules Against Illinois Strip Law

The 1943 Illinois Strip Mining Act requiring that coal companies restore the land to its original contour after stripping operations have ceased was declared unconstitutional Nov. 14 by Judge Philip J. Finnegan in Circuit Court at Chicago. He issued an injunction restraining the State from enforcing the law.

The injunction was requested in a suit filed by the Northern Illinois Coal Co. and 16 other companies representing approximately 90 percent of the strip-mine



## ELASTIC STOP NUTS



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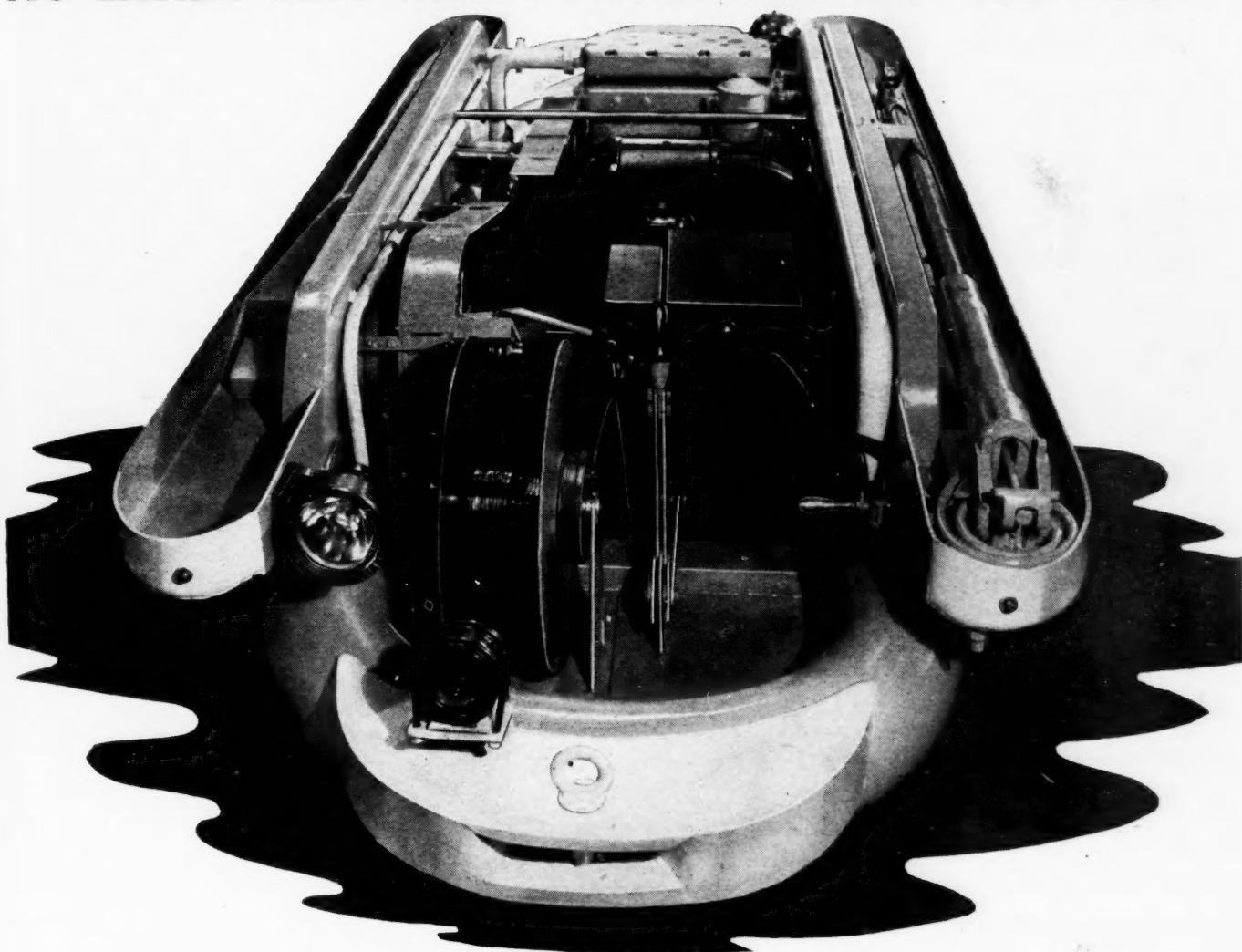
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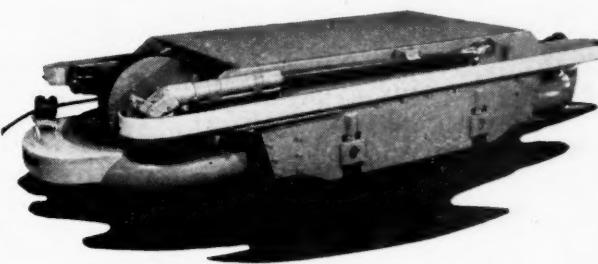
**The Cantrell Type S-P, Self-Propelled Air Compressor offers a new, broader service in a complete air compressor-locomotive combination.**

Built for dependable, rugged service, this two ton locomotive-compressor can be used for such work as ditch lining, leveling haulways, hauling repairs, shifting pumps and mining machines, chipping riveting and blowing substations. No longer is it necessary to hold up other work of heavy locomotives and crews for transporting compressors. The Cantrell Type S-P Compressor takes you to the job, does its work, and brings you back . . . all under its own power.

Maintenance costs for all Cantrell Compressors are extremely low, due to our exclusive factory rebuilt compressor exchange plan. This plan permits replacement of complete compressor unit at a nominal cost, if needed.

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Shown above is a detail view of the Cantrell, Type S-P Compressor with safety-top removed. Photo below shows compressor with safety-top in place. A simple shift of a lever changes unit from locomotive to compressor service.



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# AFTER THE BLAST



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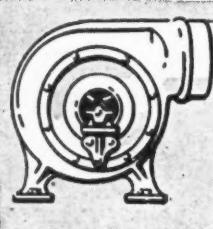
**Circulation** of good air by means of "Ventube"\*\* increases mine production and safety in many different ways. (1) Brings fresh, cool air to the men at the face. (2) Clears the face quickly after a blast, reducing down-time. (3) Prevents accumulation of coal dust in pockets near the work. (4) Keeps the ventilation system moving forward right with the work, even in the cramped space of low-roof areas.

Depend on "Ventube," at-

tached to a permissible blower fan, to reduce mining costs through better ventilation. It's light in weight and long in service life. Easy to install, to move, to store. Low in both original and upkeep cost.

For further details, consult Du Pont Technical Service, Fabrics Division, E. I. du Pont de Nemours & Co. (Inc.), Fairfield, Connecticut.

\*\*"VENTUBE" is Du Pont's registered trade mark for its flexible, synthetic-rubberized ventilating duct.



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REDUCING COSTS THROUGH BETTER VENTILATION

BETTER THINGS FOR BETTER LIVING  
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REG. U. S. PAT. OFF.

operations in the State and followed action by Attorney General George Barrett to enforce the law. The decision upheld the findings of Master in Chancery Philip Mitchell. It is expected that the decision will be appealed to a higher court.

Attorney Thomas M. Thomas, representing the strip-mine owners, contended that the law interfered with private property rights, arguing its unconstitutionality because it is discriminatory and an unreasonable exercise of State police power. He also pleaded that deep mines were not required to level ground after ceasing operations.

In a suit to test whether the granting of mineral rights under an old deed covers modern methods of stripping, H. L. Watkins was granted a temporary injunction Nov. 13 at Beckley, W. Va., by Circuit Judge Ben Ashworth, enjoining Grover C. Hedrick and others from strip mining at his Shady Springs farm. Mineral rights were granted by deed in 1907, but Watkins contended that strip mining was done with hand tools 40 years ago and that modern equipment damaged both farmland and timber.

Considerable question on future of strip-mine regulation in Ohio has been raised by the defeat of Gov. Frank J. Lausche, a recognized proponent of stripping regulation. While it is thought doubtful that Governor-elect Thomas J. Herbert would be opposed to any legislation passed by the general assembly, he is not expected to push the project as has Gov. Lausche.

The committee studying the problem is expected to release its report shortly for consideration by the new legislature.

## Humphrey Named For 1947 Rand Award

George M. Humphrey, president of the M. A. Hanna Co. and chairman of the board of the Pittsburgh Consolidation Coal Co., has been selected to receive the Charles F. Rand Medal for 1947, it was announced Nov. 29 by the American Institute of Mining and Metallurgical Engineers. The award is made from time to time to recognize distinguished achievement in mining administration, and Mr. Humphrey is the third recipient.

Mr. Humphrey was cited, "For constructive leadership in establishing great enterprises for the production of iron ore, of steel, and of coal; for signal success in the administration of large organizations engaged in these basic industries so vital to the economy of our country." Mr. Humphrey was 1946 chairman of the Business Advisory Council of the Department of Commerce and is associated with a number of mining and industrial organizations.

## To Test Operation Of Gas Turbine

Full-scale operational tests of the combustion apparatus and fly-ash separators for the coal-burning railroad gas turbine, to be made at the Kaiser steel mill, Fontana, Calif., are the next step in the advancement of the bituminous industry's



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Outstanding performance always wins recognition and acceptance...In the field of Wire Rope, "HERCULES" (Red-Strand) long ago won its place "In The Spotlight" because of its uniform reliability and economy in every industry that calls for "heavy duty" action.

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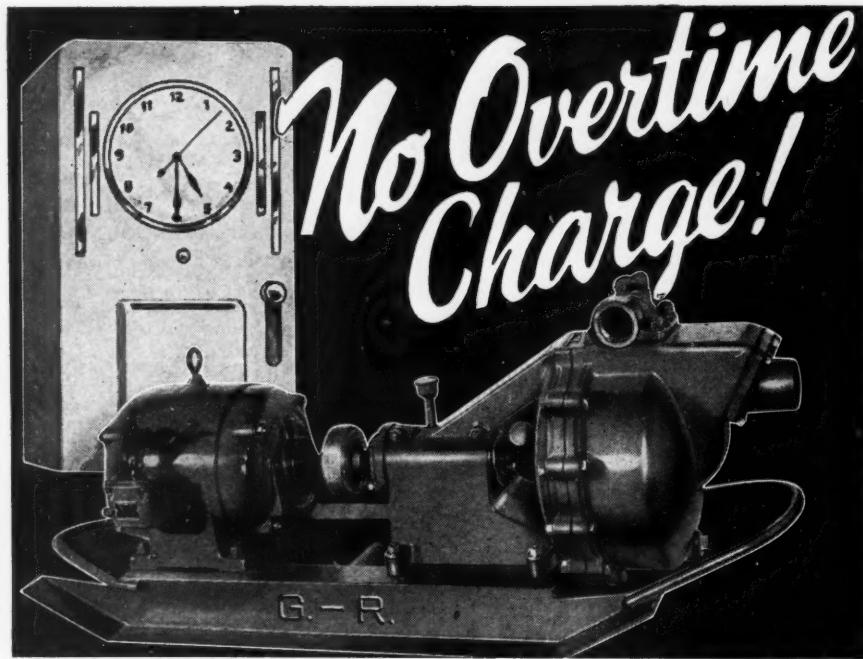
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This Gorman-Rupp self-priming, centrifugal pump is simple in construction and built for mine-gathering service.

- It is a lot of pump in a small package and especially suitable in mine locations where space is cramped.
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- This pump will handle any solids or foreign matter that will pass the intake strainer without clogging or damaging the pump mechanism.
- There is only one moving part, the impeller. This turns at motor speed to eliminate reduction gears and other wearing parts.

Made in various sizes in capacities from 4,500 to 15,000 gallons per hour and heads up to 125 feet.

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prospects for a coal-powered locomotive that can out-perform the oil-burning diesel motive power on railroads.

The steel plant in California is presently the only available source for compressed air in the great quantity needed for the powdered-coal burning combustion tests, according to John I. Yellott, director of research, Locomotive Development Committee. Full-scale equipment is expected to be built in the East this winter for burning pulverized coal under pressure at a rate of 3,000 lb. per hour and then moved to the Kaiser plant. The tests will be done in cooperation with the Northrop-Hendy Co., a subsidiary of Northrop Aircraft and Joshua Hendy Machine Works.

The tests are intended to provide actual operating experience on the equipment for the two experimental gas-turbine locomotives soon to be built. Gas turbines of 3,750 shaft horsepower are being constructed by the Allis-Chalmers Mfg. Co., and the Elliott Co. Such preliminary testing of the combustion equipment in California should enable the gas-turbine locomotives to go on the rails early in 1948, according to Mr. Yellott.

### Cooper Heads NCA Vocational Program

Appointment of Maurice D. Cooper, division superintendent, Hillman Coal & Coke Co., Pittsburgh, as manager of vocational training for the National Coal Association was announced early last month. The naming of Mr. Cooper to carry through this new training program followed study by a committee headed by L. Ebersole Gains, president, New River Co., of means to encourage more young men to study coal-mining engineering or otherwise prepare themselves for employment in the industry. After several meetings the committee recommended that a capable engineer be employed to devote his full time to vocational training.

Mr. Cooper has had long experience in the industry and is well qualified to develop the program. He will make Pittsburgh his headquarters.

### Anthracite Group Tells Supervisors of Work

A series of informative dinner meetings designed to acquaint employees of anthracite-producing companies with industry problems and methods being used to solve them has been planned by the Anthracite Institute for 5,000 key mining employees, Frank W. Ernest Jr., Institute president, announced Nov. 13.

Colliery superintendents, mine foremen, section foremen, outside foremen, fire bosses, department heads and the president, secretary and mine-committee members of each U.M.W. local will be invited to the meetings, which are to be held at the Anthracite Institute building in Wilkes-Barre, Pa.

At each meeting, in addition to the discussion, guests will visit the Institute's laboratory to inspect work being done by

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## TIREX Cables - *Lifelines* to Production

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Foremost too, among power cables, is TIREX, known to miners for many years for its dependable performance even under the most severe conditions that natural and mechanical hazards present.

Engineered to meet the most rigid specifications as to design and construction, TIREX can well be the answer to your cable requirements. The copper conductors are stranded to provide flexibility thereby eliminating delays due to snarling or twisting, and a tough jacket of Selenium Rubber Armor over the insulation furnishes protection against water and abrasives.

For insurance against costly delays in production remember Simplex-TIREX power cables the next time you equip your mining machines.

**Simplex-WIRES & CABLES**  
SIMPLEX WIRE & CABLE CO. 79 SIDNEY ST. CAMBRIDGE 39, MASS.

its engineers on development of new equipment designed to give anthracite users greater satisfaction. Engineers working on the various projects will describe details of each piece of equipment.

Meetings during the first several weeks were scheduled to include the supervisory staffs of the Lehigh Navigation Coal Co., Jedd-Highland Coal Co., Pennsylvania Coal Co., Philadelphia & Reading Coal & Iron Co. and Susquehanna Collieries Co. It is estimated that it would take the greater part of the winter to complete the full schedule of meetings planned, with groups limited in size to permit full opportunity for discussion.

### Reclaimed Strippings Provide Pulpwood

The first carload of pulpwood ever cut from Indiana land previously mined by stripping and reforested was shipped Nov. 8 from the Greene-Sullivan State Forest of Indiana near Bucktown, Ind. According to District Forester S. J. Hensler, the forest is in flourishing condition and the profit from this and future shipments will do much to make the forest self-supporting.

The timber grew on a tract of land mined in 1928 and 1929 by the Central Indiana Coal Co. and obtained by the State from the company as a result of the Indiana department's keen interest in reforestation work already accomplished by Central.

The reforestation program was started years ago by mining companies concerned with the future value of worked-over properties. State legislation making it mandatory for all strip-mining operators to reforest annually an area greater than that mined during the year followed, and the present program is supervised by the Division of Forestry of the Indiana Department of Conservation, and the Division of Forestry and Reclamation of the Indiana Coal Producers Association. The mining companies affiliated with the coal association planted more than 2,600,000 trees on mined land in 1946, and have contracted to purchase some 2,225,000 seedlings from the State's nurseries for the approaching tree-planting season.

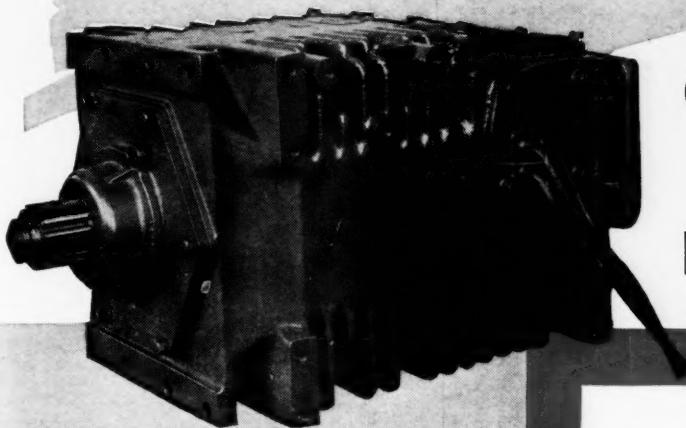
### Hudson Safety Group Holds Annual Banquet

Control of dust in anthracite mining serves to prevent miners' asthma and other forms of silicosis, Dr. H. H. Schrenk, chief of the health division, U. S. Bureau of Mines, declared at the ninth annual banquet of the Safety Key Men of the The Hudson Coal Co., at the Scranton Club, Nov. 20.

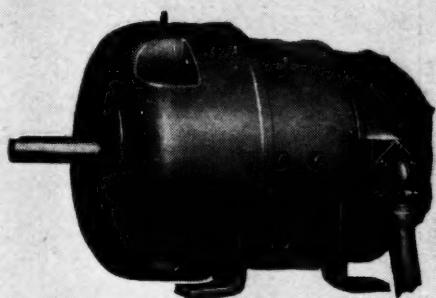
Cadwallader Evans Jr., vice president and general manager of the company, acted as toastmaster of the meeting, which was attended by 100 members and guests. Other speakers included Edgar C. Weichel, assistant general manager, and John D. Cooner, safety engineer.

Two new members enrolled in the group were Stephen Hockaday, section foreman,

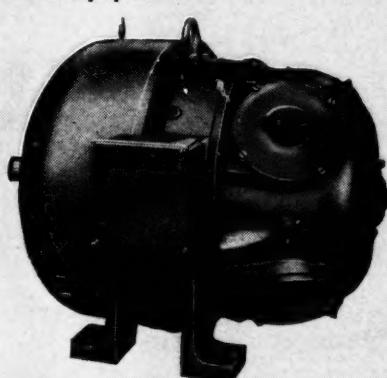
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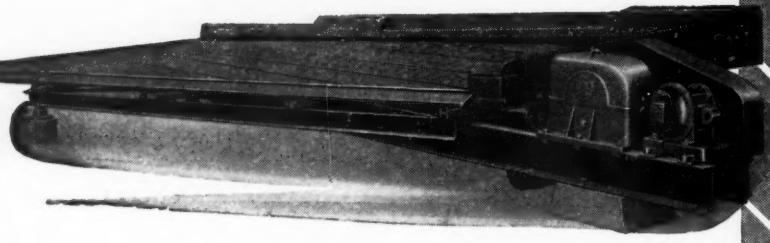
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Whether you are strip mining, whether you mine from dirty, narrow seams, or whether you are recovering coal from culm banks or rivers, SuperDuty tables make the washing of your coal to market specifications more profitable.

More profitable because SuperDuty's exclusive diagonal deck increases capacity 50%, or more, while yielding also, higher recoveries of cleaner coal.

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The Concenco Revolving Feed Distributor is a heavily fabricated all steel machine, built in various types, with motor drive requiring less than  $\frac{3}{4}$  H.P. in operation. This distributor effects perfectly a splitting of feed sluiced to its revolving tank, into any desired number of equal portions. It is especially suitable for efficiently feeding a battery of coal washing tables, giving an equal distribution of feed to each table.

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Marvine colliery, 80,912 man-hours without a lost-time accident, and Harold Young, section foreman, Delaware colliery, 110,352 man hours without a lost-time accident.

## Piney Fork Team Wins Ohio Meet

The Eastern Ohio safety and accident-prevention meet postponed from Sept. 29 because of rain was held Oct. 13 in the Wheeling, W. Va., Market Auditorium, with 15 teams participating. The team from Piney Fork No. 1 mine, Jefferson Coal Co. (Hanna Coal affiliate), took top honors with a score of 99.9. Teams from the Dun Glen mine and the Willow Grove No. 2 mine of the Hanna Coal Co. placed second and third with ratings of 99.8 and 99.7, respectively.

The Warner Collieries Co.'s teams from Camel Run and Wolf Run mines were fourth and fifth, respectively, with scores of 99.6 and 99.5. The team from the Goodyear mine of the Wheeling Township Coal Co., took sixth place.

James P. Collins, safety director, Warner Collieries Co., acted as chairman of the meet.

## Central W. Va. Group Holds Final Meeting

George R. Higinbotham, vice-president of operations for the Consolidation Coal Co. of W. Va., was elected president of the Central West Virginia Coal Mining Institute at its final meeting of the year, held Nov. 8 at Clarksburg. Arthur E. Belton, secretary, and P. J. McGraw, treasurer of the institute, were re-elected.

Vice presidents appointed at the meeting were: C. I. Bennett, Alfred R. Reppert, J. H. Nuzum, C. H. Higinbotham, M. J. Andrews, B. H. Cutright, John Hogue, Otto Hyer, William Christia, Ora Cunningham, Don Potter, Cecil E. Jenkins, F. K. Day, E. P. Brennen, C. M. Hoard, K. W. Bartlett and E. F. Miller.

Members saw a technical film presented by J. L. Thornton and Fred Stevenson, engineers for the Goodyear Tire & Rubber Co., which portrayed the transportation of earth material for dam building near Boise, Idaho. The picture was entitled "The Way Over The Mountain."

It was voted to suspend the winter meetings during the months of December, January and February.

## Gasification Tests Prove Satisfactory

Although the complete analysis of the recent gasification of rice and barley anthracite in an oxygen-blown Wellman-Galuska gas producer at the Consolidated Mining & Smelting Co. of Canada, Ltd., Trail, B. C., has not been released, the preliminary results are said to be encouraging.

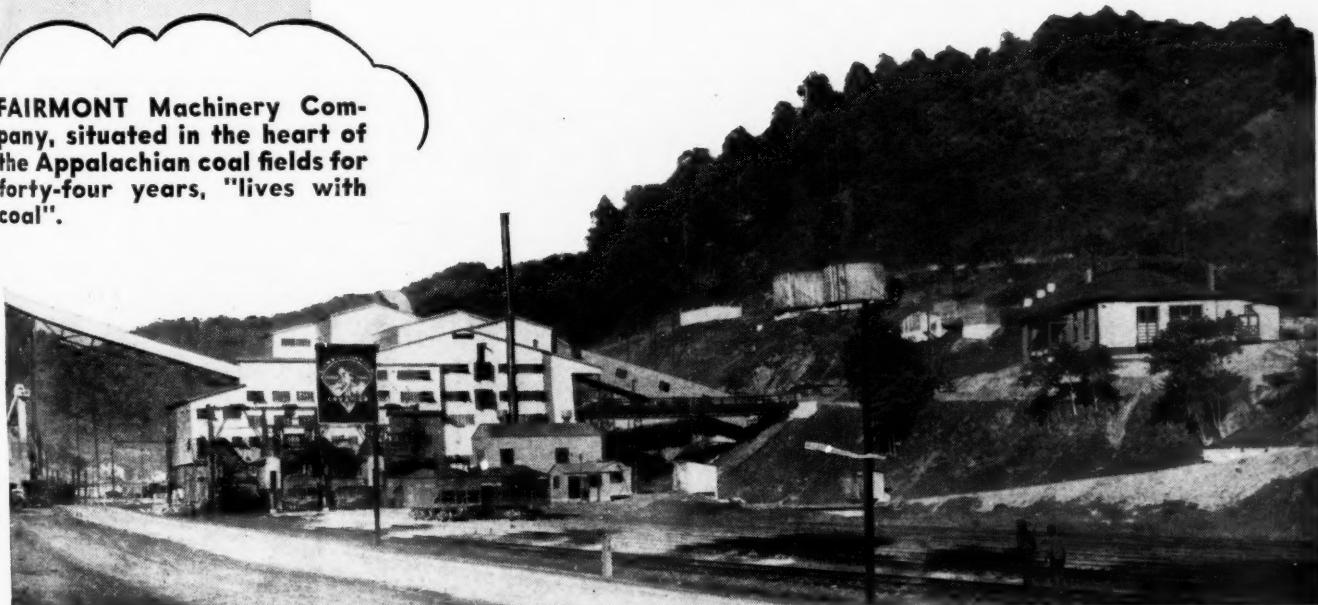
Dr. C. C. Wright, Pennsylvania State

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through better coal,  
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FAIRMONT, W. VA.

# Conservation Welding Cuts Costs at Coal Mines . . . . .



Application of Amsco Conservation Welding Products to worn parts, and to new parts destined for severe wear, affords additional service life of far greater value than the cost of the application.

For example, teeth cost on power shovel dippers can be substantially



reduced by build-up-welding, as detailed in the above sketch. This method gives dipper teeth an extended service life at a cost less than that of new teeth.

Worn dipper teeth are quickly and economically re-pointed with Amsco Cast Repointer Bars, which are available in 31 sizes. Appropriate widths are torch cut from the bar, tacked on to the worn tooth, filled in, and finally hard surfaced with Amsco No. 459 or Economy Hardface.

Amsco Cast-to-Shape Dipper Tooth Repointers (another type) fit over worn teeth, are simple to apply, and are available in five styles and numerous sizes for application to practically all types and makes of dipper teeth.

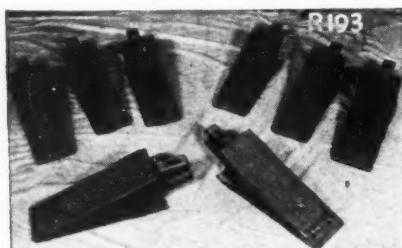


Illustration A-214-B shows dull, inefficient dipper teeth which have been re-pointed at small cost with Amsco Repointer Bars and a little Amsco Nickel-Manganese Steel Rod.

The service life of even new dipper teeth (See R193) is greatly lengthened by proper application of protective coatings of shock and wear resistant Amsco No. 459 Hard-Surfacing Rod or Economy Hardface.

Another example is the roll crusher segment used in a coal preparation plant, shown (W-51). The rebuilding job is in progress on this segment; a case where the worn teeth have been built up repeatedly to their original height with Amsco Nickel-Manganese Steel Welding Rod and then surfaced with Economy Hardface. The Economy welded cap is hammered to a point while the weld metal is still hot.

You will find the use of Amsco Conservation Welding Products profitable. Write for full information.



(*Amsco Welding Products are produced and sold in Canada by Canadian Ramapo Iron Works, Inc., Niagara Falls, Ontario.*)

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Foundries at  
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Denver, Colo.; Oakland, Calif.;  
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Offices In Principal Cities  
**AMERICAN MANGANESE STEEL DIVISION**  
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College, concludes that rice and barley anthracite can be satisfactorily gasified with oxygen and steam to yield a raw synthesis gas suitable for use in synthetic ammonia, synthetic methanol or synthetic gasoline processes. The composition of raw synthetic gas produced in the oxygen gasification of rice anthracite was superior to that reported for coke in the same operation. The composition of this raw synthetic gas from barley anthracite was not as favorable, but this may have been due to the inability to establish optimum operating conditions. The purity of the synthesis gas from anthracite compared favorably with that produced from coke. The inert content was about the same, while tars and condensable residues were appreciably lower or non-existent. The tests were not of sufficient duration to determine the effect on the catalyst, equipment, etc. No trouble of any kind was experienced with the use of anthracite gas in the synthesis process during the three-week test period.

In the oxygen steam-blown producer it was possible to gasify rice at a 100-percent and barley at 200-percent faster rate than in the same type producer using air and steam with the same two sizes.

From the factual information obtained on these tests, it will be possible to establish best operating procedures, cost data and future lines of endeavor. Definite proposals can now be made to the chemical industry with the view to expanding the use of anthracite into the synthetic field.

## State Safety Meet Held at Lexington

In a state-wide competition held in Lexington, Ky., Nov. 9, Mine No. 207 of the Consolidation Coal Co. (Ky.), Elmer Lawhorn, captain, took first place in the first-aid contest. The team from the Inland Steel Co., Wheelwright, Ky., W. A. Pack, captain, placed second in first aid and also won first place in mine-rescue work.

Favorable mention went to teams from the South-East Coal Co., Seco; Blue Diamond Coal Co., Blue Diamond; Utilities Elkhorn Coal Co., Esco; Pond Creek Colliery Co., Pond Creek; Pioneer Coal Co., Pioneer; North-East Coal Co., Thealka; and the Black Mountain Coal Co., Black Mountain.

## Wyoming Institute Expands Coal Study

The Natural Resources Research Institute, organized in 1943 as a department of the University of Wyoming, has appointed Charles C. Boley, formerly of the Illinois State Geological Survey, as coal research engineer. He will make a general survey of the coal industries of Wyoming, and contact both large and small coal producers in order to put the Institute's coal program on a broader basis. A conference of Wyoming coal producers will be held, technical problems discussed, and the coal-research program of the Institute ex-

# CUT DRAINAGE COSTS

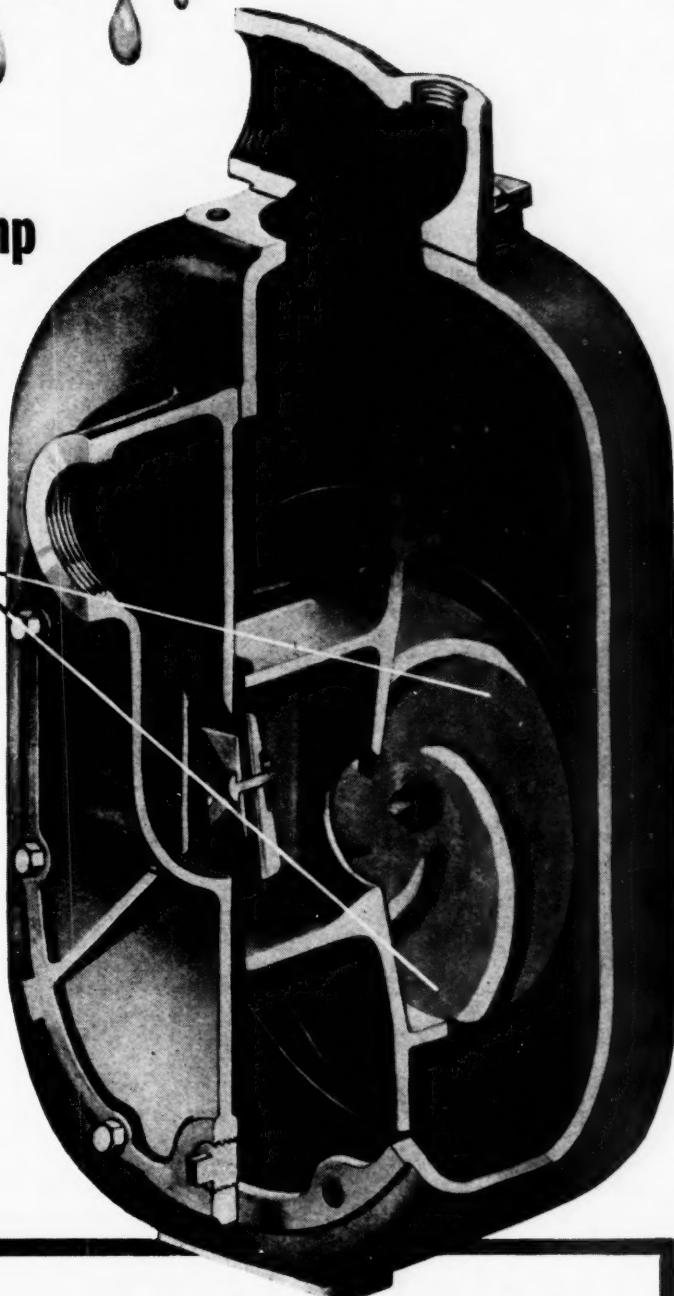


...with the

## MARLOW Mine Gathering Pump

*Look Inside  
for the reasons why!*

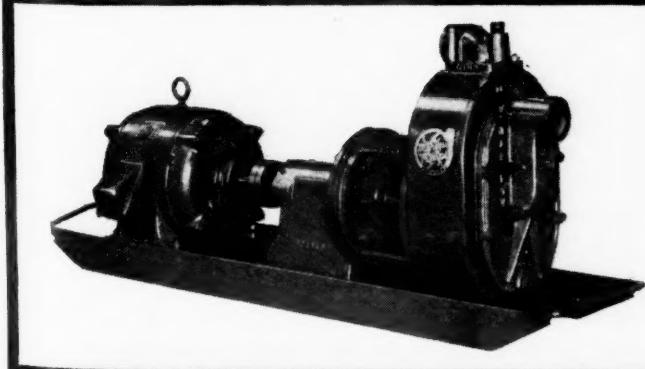
One important reason—a Marlow will work well despite wear because it permits relatively large clearances at the tip of the impeller. Only in the Marlow Mine Gathering Pump will you find a design that assures continued positive self-priming and high pumping efficiency... even after the impeller vanes have become worn from excessive abrasion.



### MANY OTHER REASONS

A Marlow Self-Priming Centrifugal is the fastest priming centrifugal pump yet developed. It will pump more water per horsepower than any other mine gathering pump and is positively automatic in performance, even when the pump is placed as high as 25 feet above water. Available in 2-inch and 3-inch sizes, mounted on sled-type base or rubber-tired tricycle.

Ask for Bulletin EM46 and name of nearest distributor.



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Since 1924*



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Even if your plant's dust is worthless, it pays to keep DUST HOG from devouring profits—interfering with worker efficiency, helping wear out equipment, soiling finished goods, causing accidents.

A free booklet, "Control of Industrial Dust," tells how to eliminate costly "dust pockets". Write PANGBORN, 288 Pangborn Boulevard, Hagerstown, Maryland—*world's largest manufacturer of dust control and blast cleaning equipment.*

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panded, inasmuch as Wyoming is considered to have the largest sub-bituminous coal reserves in the United States. Other long-term projects engaged in by the Institute include the processing of Western phosphate rock, bentonite and other clays, sugar-beet pulp derivatives and recovery of values from placer deposits.

### Personal Notes

The Hudson Coal Co. has announced several changes in personnel. J. B. T. Jones, formerly assistant general manager in charge of labor, has been named labor consultant for the company. He has been succeeded by A. J. Wiegand, superintendent of the Olyphant colliery. W. L. Stonebraker, superintendent of the Baltimore colliery, takes Mr. Wiegand's place as superintendent of the Olyphant colliery, and he in turn is succeeded by Raymond J. Morgan, previously assistant superintendent at Olyphant. William W. Martin, inside foreman at the Olyphant colliery, becomes assistant superintendent at that mine.

Charles J. Golden, formerly assistant to the division engineer, has been appointed division engineer of the Delaware and Pine Ridge collieries, succeeding Howard M. Girton, deceased. John T. Griffiths, engineer in the office of assistant general manager for engineering, has succeeded Mr. Golden and he in turn has been replaced by William E. Thompson of the mining engineering department. Karl T. Miller, formerly inside foreman at Baltimore No. 5 colliery, has been appointed dust engineer in charge of dust-control work. Ralph L. Van Horn, inside foreman at Eddy Creek colliery has become inside foreman at the Baltimore No. 5 colliery and has been succeeded by Andrew M. Brown.

Walter J. Johnson, previously general superintendent for the Roundup Coal Mining Co., Roundup, Mont., has been appointed general superintendent of Mine No. 5 of the Centralia Coal Co., Centralia, Ill., in addition to a similar capacity at the new Murdock mine of the Bell & Zoller Coal & Mining Co.

John A. Dunn, electrical engineer, has been named electrical superintendent for the Island Creek Coal Co., Holden, W. Va., succeeding H. L. Bradshaw Sr., deceased. Ralph Kirchner has been appointed assistant electrical superintendent and also will continue as electrical inspector.

The Consolidation Coal Co. (Ky.), Jenkins, Ky., has announced several changes in its supervisory staff. Arlie Webb, motor-man and returned serviceman, has been promoted to fire boss at Mine No. 207, Jenkins. Hershel Childers has been made assistant foreman at Mine No. 207, and at Mine No. 204, H. Carl Mercer, formerly assistant mine foreman, has been promoted to mine foreman, and Andy Branham, previously section foreman, to assistant mine foreman. C. A. Card, section foreman at the Clover Splint mine, has been made mine foreman at that mine, and Lewis C. Jones has been pro-

# This Bit cut coal drilling time

from  $1\frac{1}{2}$  hours  
to 5 minutes

... PAID FOR ITSELF IN  
THE ONE OPERATION

Here are the facts according to  
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Job . . . to drill five holes in the face of Miller Creek No. 1 seam coal to a depth of 5 feet.

Equipment . . . a Jeffrey A-7 hand-held drill, steel bits, and a Kennametal HD- $1\frac{3}{4}$ " bit.

Test . . . to compare the drilling time of ordinary steel bits and Kennametal bits.

Results . . . it took four men operating the drill  $1\frac{1}{2}$  hours to do the job when using steel bits. It took two men only 5 minutes to do the job using Kennametal bits. Depth, number of holes drilled, and coal were all identical. This bit paid for itself in the one operation. *Kennametal bits not only drill fast . . . they are economical besides!*

This is another example of unbelievable performance where Kennametal cutting edges are being used. It helps explain why this amazing metal keeps bringing high production at low cost to more and more coal mines every day.

Kennametal cutting edges are harder than any metal ever successfully used in the cutting edge of a bit made for drilling. High compressive strength makes it take repeated shock, and not fail. Its extreme hardness enables it to take a beating, outlast, stay sharp, and do tough drilling jobs that ordinary steel drills won't touch.

We will be glad to have our representative covering your district contact you. Simply drop a card to the Mining Division, Kennametal Inc., Latrobe, Pa.

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## **Muscatine, Iowa**

**CUTS PUMPING COSTS**

moted to chief clerk at the Clover Splint office. Aaron Hall and Frank Roberts have been promoted to section foremen at Mine No. 214, McRoberts, Ky. Mitchell N. Long, motorman at Mine No. 207, has been appointed dispatcher.

**Ted Mosgrove**, safety director of the South-East Coal Co., Secc, Ky., has joined the Harlan County Coal Operators Association and will supervise the offices in both Middlesboro and Harlan, Ky.

Three deputy State mine inspectors have been named by Gov. Simeon Willis of Kentucky, as follows: Sterling Castle, Hi Hat, Ky.; H. G. Lovelace, Hazard; and Mart V. Bailey, Majestic.

**Terry Chandoha**, formerly plant engineer, has been appointed assistant general mine foreman of the Carswell mine, Koppers Coal Division, Kimball, W. Va. He has been succeeded by **Donald B. Shupe**, previously transitman at the company's Keystone mine.

**Robert McKee**, formerly mine manager of Mine No. 1 of the Superior Coal Co., Gillespie, Ill., has been named assistant superintendent of mines for the company. **Conrad Ulz Jr.**, assistant mine manager of Mine No. 1, has been appointed mine manager to succeed Mr. McKee.

**Madison A. Dunlap**, formerly land agent, and recently appointed assistant to the president of the Consolidation Coal Co. (Ky.), Jenkins, Ky., has been named selling agent for the company in the sale of miners' homes and other real estate under Consolidation's recently announced program of disposing of non-mining property.

**Walter R. Keagy Jr.**, formerly a Navy lieutenant, has joined the fuels-technology staff of the Battelle Memorial Institute, Columbus, Ohio. **James H. Cook**, an engineer with the North American Aviation Corp., has been appointed to the Institute's division of fuels research.

**James R. Garvey**, former Army Air Corps captain, has joined the development-engineering staff of the Bituminous Coal Research, Inc., Pittsburgh, and will expedite the production and home-testing of BCR smokeless stoves.

**Robert C. Hill** retired Nov. 18 as active chairman of the Pittsburgh Consolidation Coal Co., ending 53 years of active service in the coal industry. Mr. Hill will continue as director and honorary chairman.

In 1893 he helped organize the Madeira Hill Co. which was prominent in the production and distribution of coal. He was chairman of Consolidation Coal Co. from 1928 until its merger with the Pittsburgh Coal Co. last year when he assumed chairmanship of the merged company. He also served as president of Consolidation from 1935 to 1943.

**George M. Humphrey**, Cleveland, was elected chairman to succeed Mr. Hill. Mr. Humphrey has been president since 1929 of the M. A. Hanna Co., as well as director of many other companies.

Evan Evans, vice president and general manager, Lehigh Navigation Coal Co., Inc., Lansford, Pa., has been elected to



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# Production Equipment for MODERN MINING



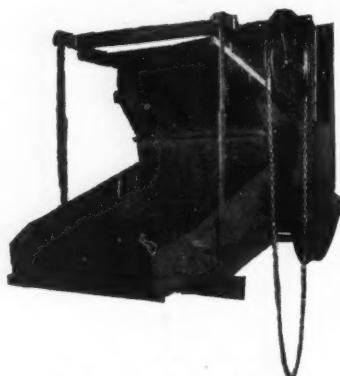
**Grizzlies and Screens**

Grizzlies are built in various sizes, to meet your requirements. Large capacity, non-clogging.



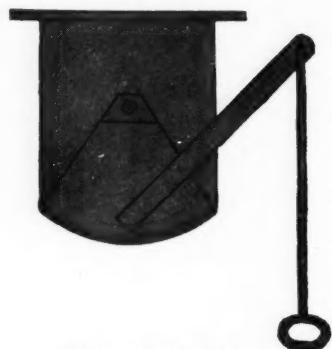
**Holmes Lowering Spirals**

Gently deposit fragile materials on the peak of the pile in bulk storage bins, eliminating vertical drop.



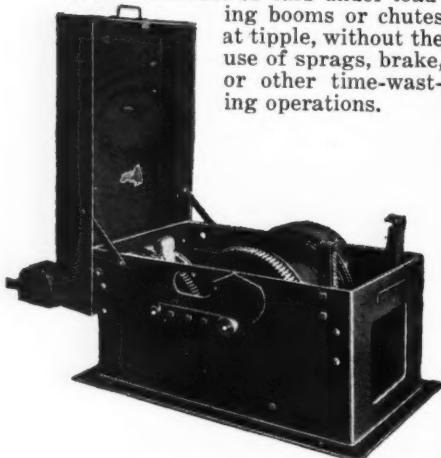
**Holmes Dust-O-Lator**

A self-contained unit, combining a withdrawal gate, mechanical screen, and automatically controlled power unit for use in removing objectionable dust and fines from coal as it flows to the truck.



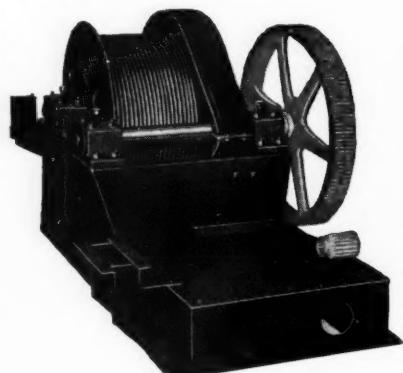
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Fabricated welded steel plates. Gate quadrant balanced on steel pins. May be operated by pull rod or cables. Suitable for bottom discharge bins.



**Electric Car Retarder**

Designed to offer complete control over movement of cars under loading booms or chutes at tipple, without the use of sprags, brake, or other time-wasting operations.



**Hoists**

Custom built to suit local conditions; available for steam or electric power from fifty horsepower up.

**ROBERT HOLMES AND BROS.**

BINS GATES LOWERING SPIRALS DUST-O-LATORS SHAKING GATES  
DANVILLE, ILLINOIS

the board of directors of the company. Mr. Evans first worked for Lehigh Navigation as a water boy during school vacations, later joining the company as a full-time member of its engineering staff.

**John P. Schwartz**, general assistant mine foreman at the Carswell mine, Koppers Coal Division, has been promoted to general mine foreman at the company's Maitland mine, Maitland, W. Va.

**Dr. John O. MacLean**, for the past ten years chief of surgical service, Scranton State Hospital, has been named chief surgeon of the Glen Alden Coal Co. and the Moses Taylor Hospital.

**John R. Shoffner** has resigned as chief engineer of the Allegheny River Mining Co., and of the Freebrook Corp. and its affiliated companies to devote his full time to his consulting engineering practice, with offices in the Empire Bldg., Kittanning, Pa.

**Allen J. Johnson**, formerly with the Anthracite Institute, has begun a practice as a fuel and combustion engineer, with offices in Lansdowne, Pa.

**Lee D. Siniiff**, associated for the past 13 years with the Rochester & Pittsburgh Coal Co., Indiana, Pa., has joined the Consolidation Coal Co. (Ky.), Jenkins, Ky., as a mechanical and electrical engineer.

**A. F. Arbury** has been granted a temporary leave of absence by the Pocahontas Operators' Association to join the Coal Heating Service Division of the National Coal Association as that group's first field representative, to assist retail merchants in various communities. Mr. Arbury has been active in the coal industry for the past 39 years.

**Charles R. Nailler**, recently general manager of deep mines for the Hanna Coal Co., has been elected operating vice president of the Pursglove Coal Mining Co., Pursglove, W. Va.

## Obituary

**Gordon Buchanan Sr.**, 83, vice president of the Old Ben Coal Corp., Chicago, died in the Highland Park hospital Oct. 26. He had been active among Chicago coal operators since 1881.

**Harry M. Hall**, vice president, Consolidation Coal Co., Chicago, died suddenly Oct. 25 while on a hunting trip in South Dakota.

**William H. Cunningham**, 67, general superintendent, Linton Summit Coal Co., Linton, Ind., died Nov. 4 at his home following a heart attack. Mr. Cunningham had been associated with Linton Summit for 30 years, the last ten as general superintendent.

**John S. W. Holton**, 83, president of the Sterling Coal Co., Philadelphia, since 1907, died Oct. 31 at his home in Merion, Pa., following a heart attack. He entered the coal business with a firm that was reorganized in 1889 as the Sterling Coal



**Ever alert—I-T-E Sectionalizing Circuit Breakers watch for the first sign of danger from electrical disturbances in mine trolley wires and feeder circuits. A roof falls or a wreck occurs—a trolley wire goes down—a circuit shorts—and the I-T-E Sectionalizing Circuit Breaker goes into action. Automatically it opens and remains open until danger passes and line conditions return to normal.**

**Not only do I-T-E Sectionalizing Circuit Breakers offer greater protection against mine fires, but other distinct advantages as well. Properly arranged in mechanized mines, they protect both feeder and equipment in every mechanized section**

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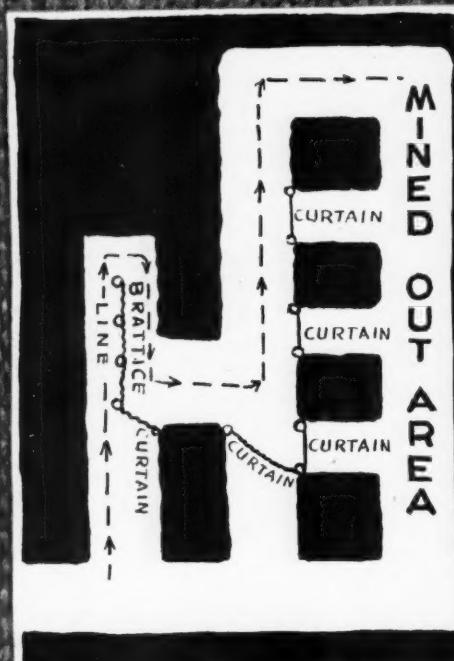
**Their use increases production, improves voltage, decreases power demand and total kilowatt consumption, reduces maintenance and repair and holds lost time resulting from electrical disturbances to an absolute minimum.**

***Write today for Bulletin 2503 containing detailed information about this equipment or, if your problem needs immediate attention, call the nearest I-T-E representative for engineering information. I-T-E application engineers are located in all principal mining areas. The I-T-E Circuit Breaker Company, 19th and Hamilton Streets, Philadelphia 30, Pa.***



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Coal: the  
direct fuel.  
Requires no  
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to handle  
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Deliver the air to where the men  
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ventilating worked out areas.  
Install ABC Jute Brattice Cloth  
for better mine "Air Conditioning" . . .  
better working conditions.

Every square inch of ABC Brattice Cloth  
is chemically treated under laboratory control  
to resist flame, mildew, and leakage.  
Usage in every coal mining section has proved  
the superiority of ABC Brattice Cloth for  
durability under all conditions. Consult your  
local ABC Mine Ventilation Engineer.

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**A M E R I C A N**  
**B R A T T I C E C L O T H C O R P.**  
**, W A R S A W , I N D I A N A**

Co. He was also president of the Philadelphia Belt Line R. R. and for 31 years, until 1934, was president of the Philadelphia Maritime Exchange.

O. G. Sharner, 61, special engineer for the Union Pacific Coal Co., Rock Springs, Wyo., died Oct. 18 in a Salt Lake City hospital after an illness of several months. Mr. Sharner was associated with Union Pacific from 1909 until 1914, and from 1924 until his death, holding various engineering and supervisory positions with the company.

Gordon H. Wilcox, 81, retired mining engineer, died Nov. 12 in a Bluefield, W. Va., hospital. He was a mining engineer with the Mineral Railroad & Mining Co., Shamokin, Pa., until 1906 when he came to West Virginia as a mining engineer for the Tierney and Beury interests. He retired in 1941.

John Moffatt, 82, formerly fire inspector and more recently on the general staff of the Dominion Coal Co., Ltd., died Nov. 12 at Glace Bay, Nova Scotia.

Frank O. Sandstrom, 65, secretary-treasurer of the Colorado-New Mexico Coal Operators Association, died Nov. 15 in Denver, Colo. He had been active in the coal industry for more than 25 years.

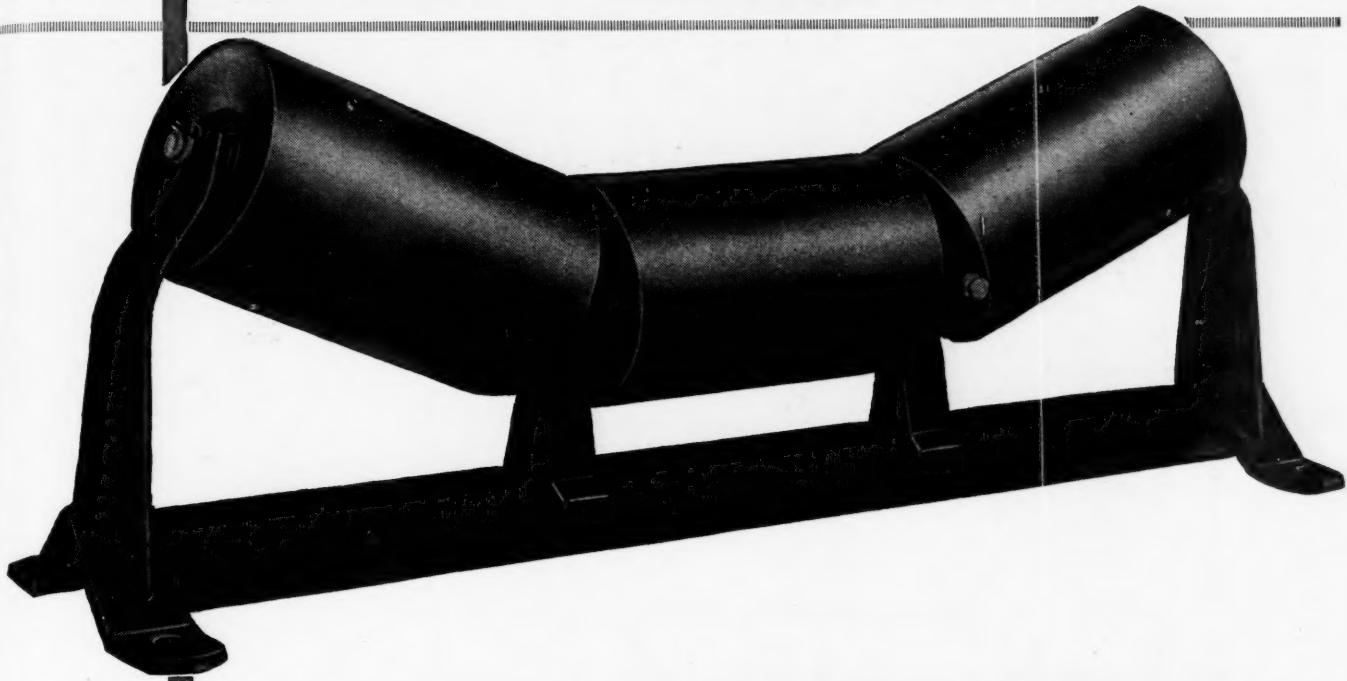
## Association Activities

American Institute of Mining and Metallurgical Engineers elected Clyde E. Williams, director of the Battelle Memorial Institute, Columbus, Ohio, president at a meeting of the board of directors Nov. 12. Elected vice presidents of the Institute were Andrew Fletcher, vice president, St. Joseph Lead Co., New York, and Robert W. Thomas, general manager, Nevada Consolidated Copper Corp. Six directors also were elected, as follows: Oliver Bowles, chief non-metallic economics division, U. S. Bureau of Mines; Arthur J. Blair, chief geologist, Tennessee Coal, Iron & R. R. Co., Birmingham; William W. Mein Sr., president, Calaveras Cement Co., San Francisco; C. V. Millikan, chief production engineer, Amerada Petroleum Corp., Tulsa, Okla.; Earle E. Schumacher, chief metallurgist, Bell Telephone Laboratories, Murray Hill, N. J.; and John R. Suman, vice president, Standard Oil Co. of New Jersey, New York.

New River Coal Operators Association, at the recent annual meeting in Mt. Hope, W. Va., elected the following officers: president, J. M. McCauley, general manager, The New River Co.; vice president, L. C. Campbell, vice president, operations, Koppers Coal Division; treasurer, P. M. Snyder, vice president, Koppers Coal Division; and secretary, S. C. Higgins.

Stoker Mfgs.' Association, at a meeting of its board of directors, Nov. 19, elected F. J. Kluempers, manager, stoker division, Fairbanks, Morse & Co., Chicago, to the board of directors, to succeed J. H. Simpson, resigned.

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## who are looking ahead...

• B-G Belt Carriers enable many operators to look ahead toward long years of low-cost material-moving service. Skillfully welded, practically unbreakable, they roll on bearings that are sealed to keep grease in—dust out. Their maintenance demands are next to nothing.

They are equally preferred among fore-

sighted plant superintendents for replacing wornout carriers—and for use in modernizing entire materials-handling operations. Belt widths 16" to 48", in various types. For information on Barber-Greene Belt Conveying Equipment, see your B-G representative. Barber-Greene Company, Aurora, Illinois.



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Simple, self-contained units quickly erected—available in 8 and 9 foot lengths.



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ACCESSORIES

Wide variety of pre-engineered units to meet particular requirements. Each unit complete, ready for installation.

**B G** Barber-Greene **CONSTANT FLOW EQUIPMENT**



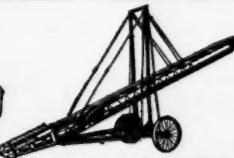
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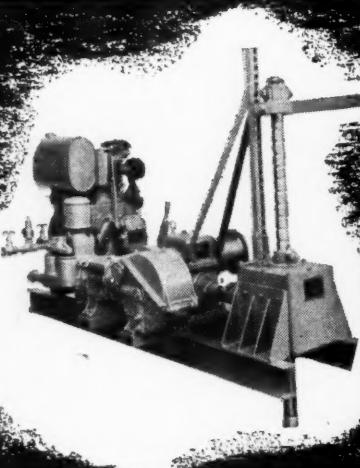


## RUBEROID INSULATING TAPE

The RUBEROID Co., Executive Offices, 500 Fifth Avenue, New York 10, N. Y.

- 1 Double grip . . . both sides adhesive.
- 2 Great tensile strength . . . tough.
- 3 Won't tear, ravel or pucker.
- 4 Resists abrasion.
- 5 Acid- and alkali-proof.
- 6 Extra thick . . . one layer insulates.
- 7 Exceeds A.S.T.M. specifications by 300% in adhesiveness, 26% in tensile strength, 290% in dielectric strength.

## CORE DRILLING FOR COAL



Keep down cost per foot by using Acker light-weight, sturdy core drills—simple to operate and easy to move in rough country.

Ideal for determining nature and depth of over-burden before strip mining. Accurate cores of coal seams by using single or double tube core barrels. Will operate diamond — alloy — steel shot bits.

Choice of mountings — trailer — truck — drag skid.

Drill tools and equipment for coal and mineral prospecting and All subsurface exploration.

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**ACKER DRILL CO.** SCRANTON 3, PA.

Indiana Coal Trade Association at its annual meeting Nov. 14 elected O. L. Scales, vice president, The Enos Coal Mining Co., Indianapolis, president of the association. P. H. Templeton, of the Glendora Coal Co. and the Linton Summit Coal Co., was elected vice president, and C. C. Lydick, of Terre Haute, was re-appointed managing director. Hugh B. Lee, vice president and general manager, Maumee Collieries Co., was elected to head the Indiana Coals Corp., with B. E. Lunblad, vice president of the Central Indiana Coal Co., named vice president, and Mr. Lydick renamed secretary-treasurer. Re-elected to head the Coal Laboratories, Inc., another branch of the association, were Mr. Lydick president, and J. Alfred Thompson, secretary-treasurer.

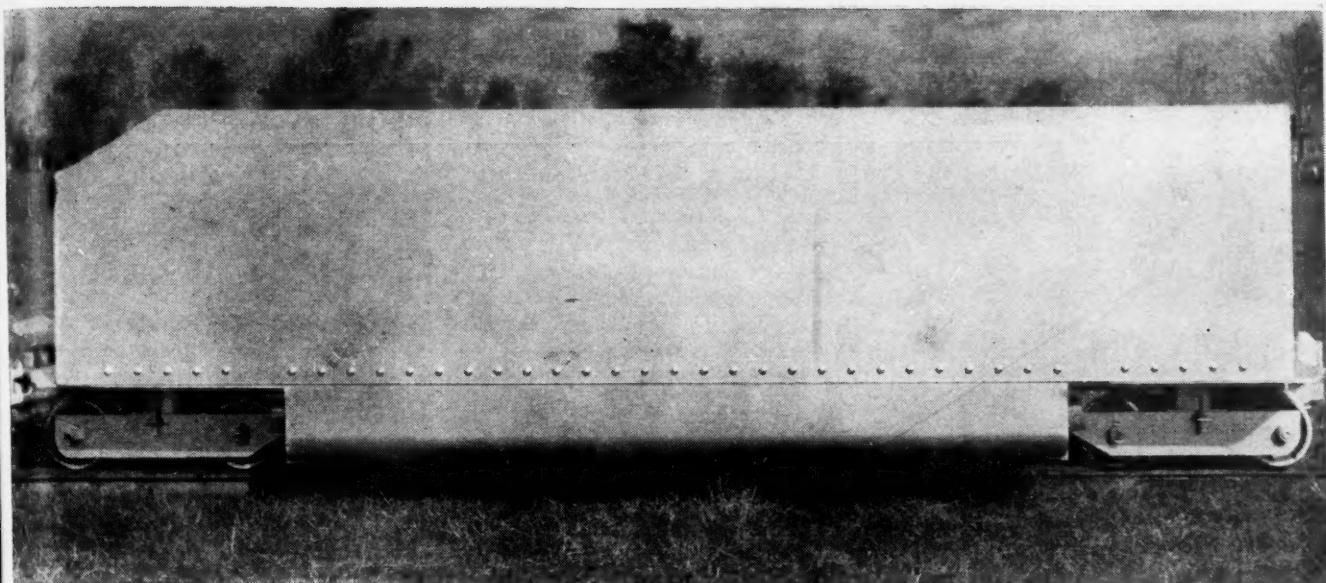
Harlan County Coal Operators Association at its 30th annual meeting Nov. 20 elected as president, Pearl Bassham, president, Harlan-Wallins Coal Corp., Verda, Ky., succeeding A. F. Whitfield Jr. C. V. Bennett, president, Harlan Central Coal Corp., was named vice president, and George S. Ward was re-elected secretary. Elected to the executive board were: Kenes Bowling, Bardo Coal Mining Co.; Charles S. Guthrie, Harlan Fuel Co.; S. J. Dickenson, Mary Helen Coal Corp.; W. J. Cunningham, Crummies Creek Coal Co.; Elmer D. Hall, Three Point Coal Co.; A. F. Whitfield Jr., Clover Fork Coal Co.; J. E. Taylor, High Splint Coal Co.; R. C. Scott, Cornett-Lewis Coal Co.; F. L. Dupree, Clover Darby Coal Co.; R. W. Creech, Creech Coal Co.; and J. S. Greene, Garmeada Coal Co.

Hazard Coal Operators Association has re-elected its officers, as follows: president, George P. Fitz, Hazard; secretary and vice president, A. E. Silcott, Hazard; directors, M. R. Dayton, Cincinnati, Finley Davis, Lexington, C. P. Gumm, Hazard, J. E. Johnson Jr., Lexington, C. B. Jackson Jr., Knoxville, Tenn., F. M. Medaris, Hazard, D. T. Mitchell, Lexington, J. S. Trosper, Hazard, and J. T. Hatfield Jr., Cincinnati.

### Preparation Facilities

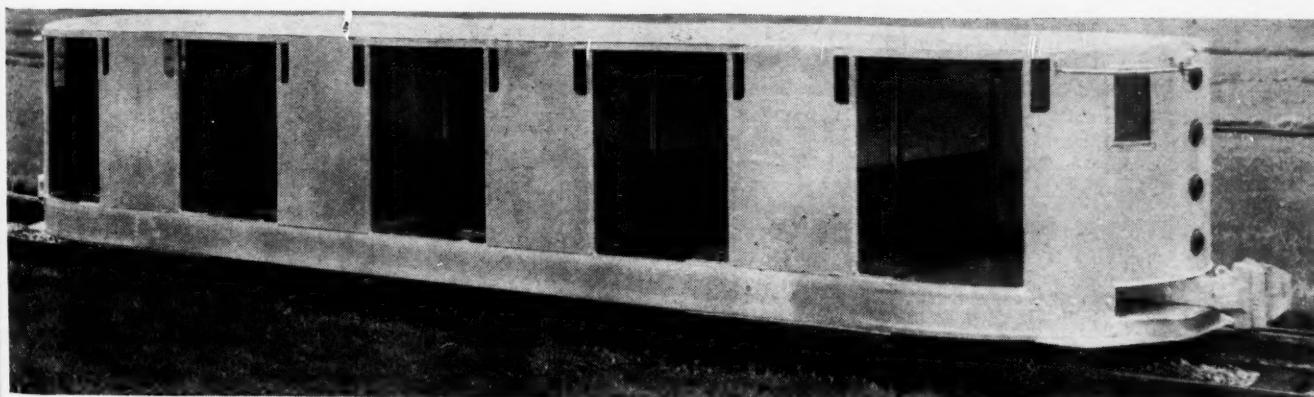
Truax-Traer Coal Co., Shamrock mine, Kayford, W. Va.—Contract closed with McNally-Pittsburg Mfg. Corp. for McNally-Rheo fine-coal plant, capacity 160 tipple and washery; r.o.m. feed, 200 t.p.h.; launders; washed coal recovered in settling boots and de-slimed at minus 48 mesh;  $\frac{1}{2}$  in.x48 mesh dewatered in four McNally-Carpenter centrifugal dryers and delivered to existing washed coal loading; refuse from the McNally-Rheo launders will be disposed of by pumping.

Caney Creek Coal Co., Greenville mine, Greenville, Ky.—Contract closed with McNally-Pittsburg Mfg. Corp. for complete tipple and washery; r.o.m. feed, 200 t.p.h.; coal to be prescreened at 6-in., with the plus 6-in. crushed to minus 6-in., then joining the 6-in. minus to be fed to one McNally-Norton compound automatic washing system. Middle-gravity products from the main washing system will be crushed and retreated in one McNally-Norton compound washer with the recovered coal joining the main washed-coal



## DIFFERENTIAL 8-Wheels MINE CARS Large capacity

Differential large capacity mine cars increase substantially the capacity of the loading units. These cars have eight wheels and the AXLESS truck with its long gentle spring action and freely rotating wheels give superior roadability performance. A large topping can be carried on the cars without spillage, thereby saving on road cleaning costs. Cars are capable of high speeds with safety. Car maintenance and track maintenance is sharply reduced when Differential cars are used. Money saving by use of Differential cars is extraordinarily high.



## DIFFERENTIAL MAN-TRIP CARS

The car shown above has a 38-passenger capacity. It gives the men a comfortable, dry ride protected from rock falls, and danger from contact with trolley wire. With these cars man trips can be speeded up with safety. The car is mounted on AXLESS trucks with long spring action making it ride extremely smooth. The men are protected against cold intake air, water, rock dust, etc.

## DIFFERENTIAL STEEL CAR COMPANY

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BURDEN-BEARING LOCOMOTIVES

MINE LOCOMOTIVES  
STOCKPILING CARS

ROCK LARRIES

DUMPING DEVICES  
COMPLETE HAULAGE SYSTEMS



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Workmen's Compensation is necessary, and in most cases compulsory...then there are individual or group policies for your personnel...and our new Underground Property Damage policy that protects YOU against loss or damage to all equipment underground—damage to shafts, passageways, retimbering

and repairing inside structures—plus damage to property above ground as result of an explosion underground.

Our Safety Engineers, authorities in their field, offer you suggestions as to the prevention of accidents in your operations.

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*For detailed information about these particular policies and others, please write or phone your local insurance agent.*

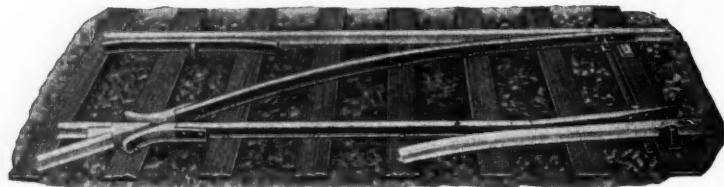


**COAL OPERATORS CASUALTY COMPANY**  
GREENSBURG, PA.

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with DEPENDABLE FROGS and SWITCHES**

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KILBY**

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**WEIR KILBY CORPORATION**  
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BIRMINGHAM 7, ALA.

flow for classifying into 6x3-, 3x2-, 2x1½-, 1½x¾- and ¾x⅓-in.; the ¼x0-in. to be sluiced to settling cone, recovered and dewatered in one McNally-Carpenter centrifugal dryer; complete mixing and crushing facilities for all washed products, with pneumatic car controls for controlling loading position of railroad equipment.

Fairview Collieries Corp., Harmatan mine, Hillary, Ill.—Contract closed with the McNally-Pittsburg Mfg. Corp. for complete tipple and washing plant, capacity 600 t.p.h. run-of-mine feed; r.o.m. reduced to 6x0-in. in one McNally-Pittsburg rotary breaker and delivered to two Mc-Nally-Norton automatic washers; 1½x0-in. taken from a bar screen just ahead of the two primary washers for diversion to McNally-Norton automatic middlings washer; middlings from the two primary washers will be crushed to 1½-in. minus and delivered to this same washing unit; washed coal delivered to classifying screen to classify at 4x2-, 2x1½-, 1½x¾-in. and ¾-in. minus; ¼x0-in. delivered to dewatering screens where ¾x⅓-in. is dewatered and delivered direct to mixing conveyor; minus ¼-in. product delivered to a special Mc Nally-Rheo fine-coal cleaning plant; ¼-in. minus washed coal hydraulically deslimed in a de-sliming sump at 60 mesh; ¼-in.x 60-mesh product then dewatered by one McNally-Carpenter centrifugal dryer; centrifuged product passed through a special McNally-Pittsburg disintegrator and mixed for loading or portions diverted to the coal company's boiler for heating purposes; complete auxiliary stoker coal plant to reduce 6x1½-in. washed coal at 320 t.p.h. with complete secondary crushing and rescreening facilities; all washed 1½x¾-in. and ¾x⅓-in. coals dried in three Mc Nally-Vissac thermal dryers.

Valley Camp Coal Co., Mine No. 3, Elm Grove, W. Va.—Contract closed with the McNally-Pittsburg Mfg. Corp. for washery and coal-preparation equipment addition to the existing No. 3 tipple for handling 315 t.p.h. of 5x0-in. raw coal; 205 t.p.h. of 5x¾-in. to be cleaned in a Mc Nally-Norton automatic washer with retreatment of crushed middlings in a rewash unit; prepared coal sizes: plus 5-in. hand picked; washed 5x2-, 2x1½- and 1½x¾-in.; ¼x0 slack is by-passed in a dry state.

Ohio Power Co., Cumberland mine, Cumberland, Ohio.—Contract closed with the McNally-Pittsburg Mfg. Co. for complete 600-t.p.h. Mc Nally-Rheo cleaning plant; run-of-mine prescreened at 5 in. with the 5-in. plus crushed in a Mc Nally-Pittsburg heavy-duty single-roll crusher down to 5-in., crushed resultant recirculated on raw-coal screen where the 1½-in. minus is delivered to vibrating screens to remove ¼-in. minus prior to washing the 5x½-in. in a Mc Nally-Rheo coarse-coal launder; all coal after washing to be reduced to 1½-in. minus and blended with the ¼-in. minus raw fines; all degradation occurring during washing will be recovered and dewatered, and included in the composite raw and washed 1½-in. minus for single track loading.

Margaret Ann Coal Co., Conaway, W. Va.—Contract closed with Kanawha Mfg. Co. for Kanawha-Belknap chloride



## WHICH COAL WILL YOU SUPPLY *This Winter?*

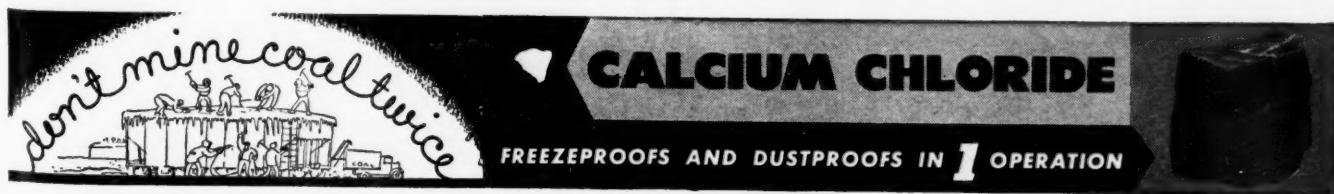
### CALCIUM CHLORIDE *Prevents Freezing...Dustproofs, too*

Will your dealers need a pick and shovel brigade to mine your coal out of their cars this winter—or will you give them coal that unloads easily, cheaply . . . coal that is freezeproofed with calcium chloride—that stays free of degradation from freezing?

Will your dealers be able to deliver coal dustproofed with calcium chloride—coal to compete with other clean fuels—coal the customers really want?

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**F**ROM ALL OVER THE NATION come enthusiastic reports on ease and speed of applying the new Extrusion COATED STOODY SELF-HARDENING! This harder, more uniform coating brings improved welding performance: Slashes welding time, assures dense deposits, minimizes porosity!

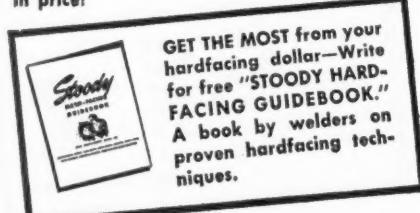
**NO MORE TEDIOUS SCALING**—where multiple passes are required, slag is easily removed while deposits are still hot—is SELF-LIFTING as deposits cool!

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**NO CHANGE IN PHYSICAL CHARACTERISTICS**—you get the same high wear resistance, same hardness—even on multiple passes!

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600 Distributors can supply you. Choice of  $\frac{1}{8}$ ",  $\frac{3}{32}$ ",  $\frac{1}{16}$ " and  $\frac{1}{4}$ " diameters. No change in price!



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1143 W. SLAUSON AVE., WHITTIER, CALIF.



washer; capacity 40 t.p.h.,  $5 \times 1\frac{1}{4}$ -in. egg coal.

**Diminick & Zupicich Coal Co.**, Shamokin, Pa.—Contract closed with Wilmot Engineering Co. for one Type D Wilmot Simplex Jig to prepare nut coal; feed capacity, 20 t.p.h.

**Centralia Mining Co.**, Centralia, Pa.—Contract closed with Wilmot Engineering Co., for complete breaker to prepare run-of-mine, stripping and bank coal; total feed capacity, 2,000 tons per seven hours; cleaning equipment consists of Chance Cone for preparing stove, nut and pea sizes; one  $3\frac{1}{2}$ -ft.-diameter Wilmot Hydrotator to prepare buckwheat No. 1, feed capacity, 30 t.p.h.;  $3\frac{1}{2}$ -ft.-diameter, Wilmot Hydrotator to prepare rice, feed capacity, 40 t.p.h.; 6-ft.-diameter Wilmot Hydrotator to prepare No. 4, feed capacity, 50 t.p.h.; 12-ft.-diameter, Wilmot Hydrotator to prepare No. 5, feed capacity, 40 t.p.h.

**Buck Run Coal Co.**, Buck Run, Pa.—Contract closed with Wilmot Engineering Co. for one 6-ft.-diameter Wilmot Hydrotator to prepare No. 4 coal; feed capacity, 50 t.p.h.

**Jeddo Highland Coal Co.**, No. 7 breaker, Harleigh, Pa.—Contract closed with Wilmot Engineering Co. for one 7-ft.-diameter Wilmot Hydrotator to prepare buckwheat No. 1 coal; feed capacity, 105 t.p.h.

**Winton Coal Co.**, South Tamaqua, Pa.—Contract closed with Wilmot Engineering Co. for one 5-ft.-diameter Wilmot Hydrotator to prepare buckwheat No. 1 coal, feed capacity, 60 t.p.h.

**Live Oak Coal Co.**, Minersville, Pa.—Contract closed with Wilmot Engineering Co. for two  $2\frac{1}{2}$ -ft.-diameter Wilmot Hydrotators to prepare buckwheat No. 1 coal; total feed capacity, 40 t.p.h.

**Rochester & Pittsburgh Coal Co.**, Lucerne mine, Homer City, Pa.—Contract closed with Heyl & Patterson, Inc., for coal-cleaning plant, feed capacity, 600 t.p.h.; first separation will be made on a screening type Bradford breaker, separating coal from rock on basis of friability; Chance cones to be employed on  $6 \times 1\frac{1}{4}$ -in. and Deister tables on  $4 \times 0$ -in.; all  $4 \times 0$ -in. to be heat dried; following sizes are to be prepared for shipment:  $6 \times 2$ -,  $2 \times 1\frac{1}{2}$ -,  $1\frac{1}{2} \times 1\frac{1}{2}$ -, and  $\frac{3}{4} \times 0$ -in.

**Moore Coal Co., Inc.**, Berea, Ky.—Contract closed with Deister Concentrator Co. for one Leahy heavy-duty NO-Blind vibrating screen.

**Locust Valley Coal Co.**, Morea, Pa.—Contract closed with Deister Concentrator Co. for six SuperDuty Diagonal-Deck No. 7 coal-washing tables to treat Nos. 1, 2, 3, 4 and 5 anthracite buck.

**Lorado Coal Mining Co.**, Lorado, W. Va.—Contract closed with Jeffrey Mfg. Co. for washing plant; capacity, 625 t.p.h. raw coal feed, r.o.m.

**Blue Diamond Coal Co.**, Bernice, Pa.—Contract closed with Menzies Separator Co. for one 6-ft. Menzies cone to clean stove coal; feed capacity, 40 t.p.h.

**Russell Mining Co.**, Spring Brook breaker, Moosic, Pa.—Contract closed with Menzies Separator Co. for one 3-ft. Menzies cone to clean rice coal; feed capacity, 12 t.p.h.

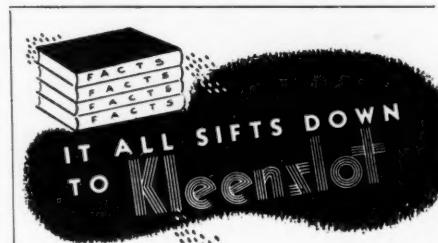
**Morgan Coal Co.**, Morgan breaker, Old Forge, Pa.—Contract closed with Menzies Separator Co. for one 3-ft. Menzies cone to clean buck coal; feed capacity, 12 t.p.h.

**Markson Coal Co.**, Goodsprings, Pa.—Contract closed with Menzies Separator Co. for one 8-ft. Menzies cone to clean stove and nut coal, feed capacity, 70 t.p.h.; and one 6-ft. Menzies cone to clean pea and buck coal, feed capacity, 40 t.p.h.

**Waddell Coal Mining Co.**, Winton, Pa.—Contract closed with Menzies Separator Co. for one 3-ft. Menzies cone to clean rice and barley coal; feed capacity, 12 t.p.h.

**Phoenix Coal Co.**, Phoenix breaker, Phoenix Park, Pa.—Contract closed with Menzies Separator Co. for one 4-ft. Menzies cone to clean No. 4 buckwheat, feed capacity, 22 t.p.h.; and one 4-ft. Menzies cone to clean No. 5 buckwheat, feed capacity, 22 t.p.h.

**Glen Alden Coal Co.**, Woodward colliery, Edwardsville, Pa.—By agreement with the Menzies Separator Co., to be manufactured by the Glen Alden Coal Co.: one 8-ft. Menzies cone to clean buckwheat coal, capacity, 70 t.p.h.; one 8-ft. Menzies cone to clean rice coal, capacity, 70 t.p.h.; and one 8-ft. Menzies cone to clean barley coal, capacity, 70 t.p.h.



• After they weigh all the facts, coal preparation plant operators vote for Kleenslot, the screen that gives highest production at lowest cost per ton.

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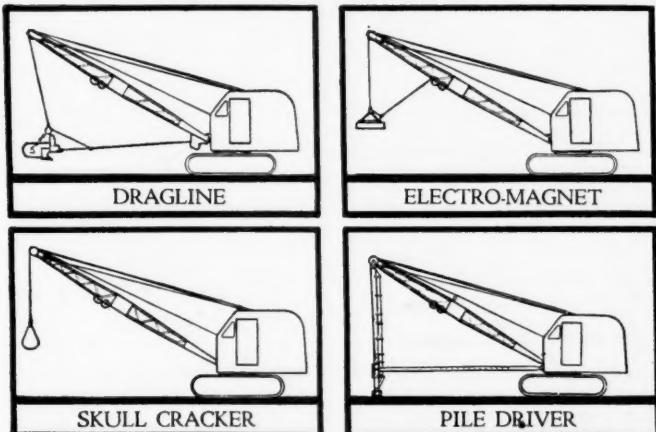
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**Glen Alden Coal Co., Wanamie**  
breaker, Wanamie, Pa.—By agreement with Menzies Separator Co., to be manufactured by the Glen Alden Coal Co.: one 9½-ft. Menzies cone to clean rice coal, capacity, 100 t.p.h.

## Mine Fatality Rate Lowered Slightly

Accidents at coal mines in the United States caused the deaths of 58 bituminous miners and 15 anthracite miners in September, 1946, according to reports furnished the U. S. Bureau of Mines by State mine inspectors.

For the two industries combined, the September, 1946, fatality rate was 1.30 per million tons, a fraction under that of 1.33 for August, 1946, and also less than that of 1.53 for September, 1945, which was later revised to 1.86.

With a production of 51,080,000 net tons, the September bituminous fatality rate was 1.14 per million tons, compared with 1.28 in August and a similar preliminary rate of 1.49 in September, 1945, later revised to 1.68.

The anthracite rate in September, 1946, in mining 5,037,000 net tons, was 2.98 per million tons, considerably higher than the August rate of 1.84 and that of 1.95 for September, 1945, later revised to 1.94.

September, 1946, fatalities, by causes and States, and comparable rates for the first nine months of 1946 and 1945, were as follows:

U. S. COAL-MINE FATALITIES IN SEPTEMBER 1946, BY CAUSES AND STATES

State	Falls of roof	Falls of face	Haulage	Underground				Total underground	Open-cut	Surface	Grand total
				Gas or dust explosion	Electricity	Machinery	Other causes				
Alabama	1	..	1	..	..	..	..	2	..	..	2
Arkansas	1	..	1	..	..	..	..	1	..	..	1
Colorado	..	1	..	..	..	..	..	1	..	..	1
Illinois	2	..	1	..	..	..	..	4	..	..	4
Indiana	1	..	..	..	..	..	..	1	..	..	1
Iowa	1	..	..	..	..	..	..	1	..	..	1
Kentucky	8	..	..	1	..	..	..	9	..	..	9
Ohio	2	..	..	..	..	..	..	3	..	..	3
Penna. (bituminous)	9	..	4	..	..	..	..	13	1	1	15
Tennessee	..	..	1	..	..	..	..	1	..	..	1
Virginia	1	..	1	..	..	..	..	2	..	..	2
West Virginia	9	..	8	..	..	..	..	17	1	..	18
Total bituminous	35	..	16	1	1	2	..	55	2	1	58
Penna. (anthracite)	9	3	1	..	..	..	..	14	..	..	15
Grand Total	44	3	17	1	1	2	1	69	2	2	73

DEATHS AND FATALITY RATES AT U. S. COAL MINES, BY CAUSES OF ACCIDENTS  
JANUARY-SEPTEMBER, 1946 AND 1945

Cause	Bituminous				Anthracite				Total			
	Number Killed	Killed per Million										
<b>Underground:</b>												
Falls of roof and face	295	352	0.753	0.802	77	52	1.704	1.266	372	404	0.851	0.842
Haulage	122	161	.311	.367	18	20	.398	.487	140	181	.320	.377
Gas or dust explosions:												
Local	1	9	.002	.020	..	4	..	.097	1	13	.002	.027
Major	27	39	.069	.089	..	..	..	..	27	39	.062	.081
Explosives	9	19	.023	.043	6	7	.133	.170	15	26	.034	.054
Electricity	17	17	.043	.039	3	2	.066	.049	20	19	.046	.040
Machinery	18	36	.046	.082	1	2	.022	.049	19	38	.044	.079
Shaft	7	10	.018	.023	1	1	.022	.024	8	11	.018	.023
Miscellaneous	16	14	.041	.032	10	8	.221	.195	26	22	.060	.046
Total underground	512	657	1.306	1.497	116	96	2.566	2.337	628	753	1.437	1.569
Stripping or open-cut	14	20	.036	.045	6	2	.133	.049	20	22	.046	.046
Surface	35	46	.089	.105	7	9	.155	.219	42	55	.096	.114
Grand total	561	723	1.431	1.647	129	107	2.854	2.605	690	830	1.579	1.729

\* All figures are subject to revision.

**HUDSON RUMSEY**  
CO. INC.  
1200 NIAGARA ST. BUFFALO, N.Y.

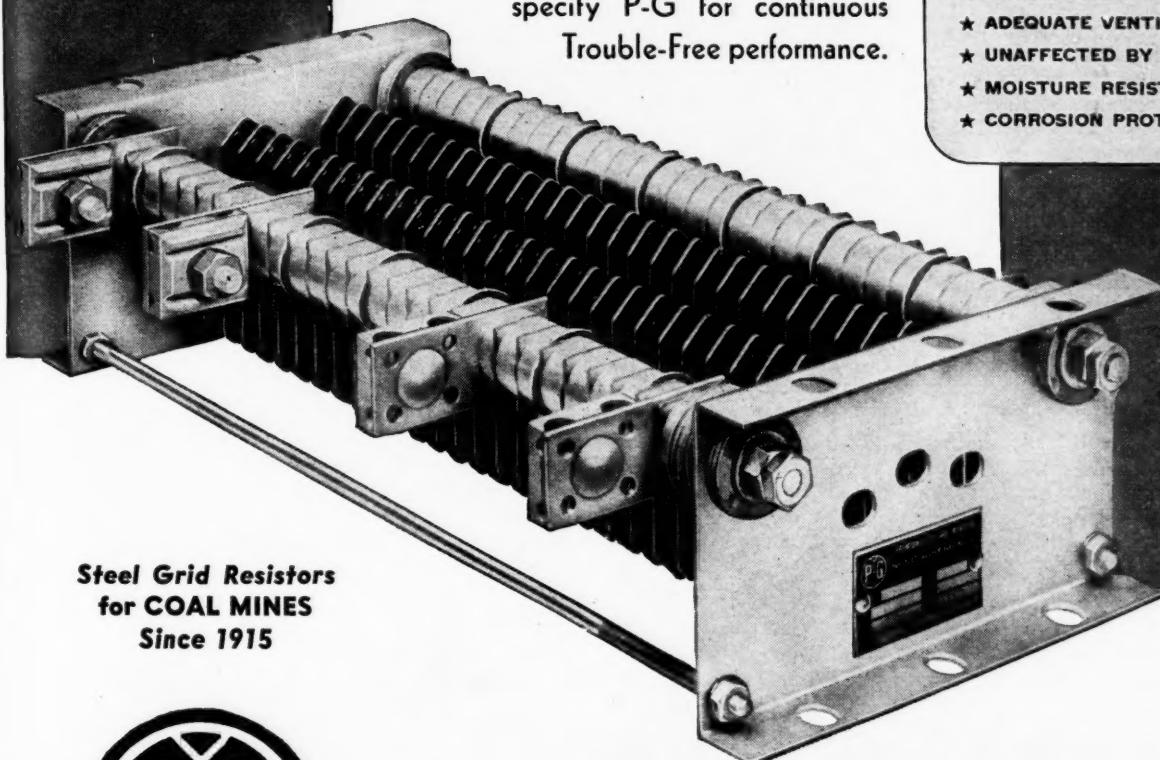
# Dependable Performance

*always with*

## P-G Steel Grid Resistors

In mines widespread acceptance of P-G Steel Grid Resistors is the direct result of outstanding records for constant dependable performance. Service records are created by use of durable materials in unique and exclusive design to produce resistors able to easily meet the most exacting requirements. Always specify P-G for continuous Trouble-Free performance.

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- ★ ADEQUATE VENTILATION
- ★ UNAFFECTED BY VIBRATION
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# Equipment News

More Detailed Information and Descriptive Literature Normally  
Are Available on Request Directly to the Manufacturer

## Electric Motor

Allis-Chalmers Mfg. Co., Milwaukee, Wis., announces production of a complete line of outdoor-weatherproof, totally inclosed motors in the larger sizes ranging up to and above 2,000 hp. Principal change in the new line of motors in the larger ratings is a complete redesign of the ventilation heat-transfer system, according to the manufacturer. All air passages are practically self-cleaning and pockets in which water or liquid might be trapped have been eliminated. Air passage tubes can be easily cleaned with a brush or an air or water hose.

## Truck Crane

The Milwaukee Hydraulics Corp., Milwaukee, Wis., has released its Model H-2 two-ton Hydrocrane, said to be a radically new development employing full hydraulic control for every operation, eliminating entirely all gears, clutches, brakes and drums.

The standard tubular boom raises and lowers as well as telescopes from 16 to 22 ft. under hydraulic power, enabling operator to spot loads quickly and accurately, reach into box cars, over walls or piling, between beams or into buildings, according to the manufacturer. 360-deg. swing is provided, and ample stability is assured by means of hydraulically powered outriggers, it is said.

The Model H-2, particularly designed for small-scale jobs, mounts on 1½-ton trucks or special 6x6 drive Jeeps available at the factory. For clamshell service a standard ½-yd. bucket, hydraulically powered, is available as well as a hydraulic low-headroom bucket for congested quarters.

## Shuttle-Car Tire

A new pneumatic tire for use on shuttle cars and other equipment in underground mine service has been announced by The B. F. Goodrich Co., Akron, Ohio. The tire has been specially designed for the



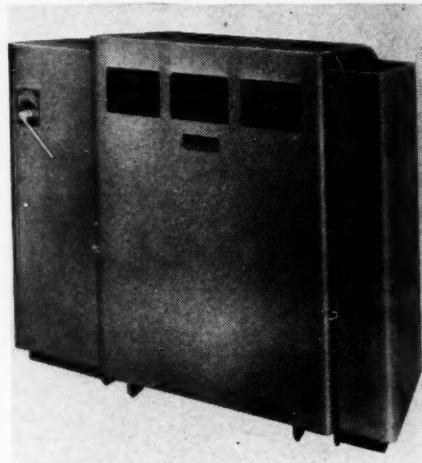
severe demands of mine operation, with round shoulders and extra thick sidewalls to protect it from snagging and cutting, and has two-way traction, according to the manufacturer.

The tire is at present being produced in several sizes, including 7.50-15 ten-ply. Maximum load for this tire at 5 m.p.h. is 4,340 lb.; at 10 m.p.h., 3,880 lb., and at 30 m.p.h. 2,530. The two other popular mine-tire sizes, 8.25-15 and 10.00-15, give a complete range for this type service, according to the company.

## Unit Substation

High-voltage incoming-line, transformer and low-voltage feeder sections are said to be combined in one compact assembly in the new All-In-One unit substation built by the Wagner Electric Corp., St. Louis. Installation is simplified as the units are delivered ready to connect.

Illustrated is the completely inclosed, streamlined All-In-One unit substation with air-cooled transformer for indoor installation. Noflamol (noninflammable-liquid-filled) or oil-filled transformers also are available. The units are standardized



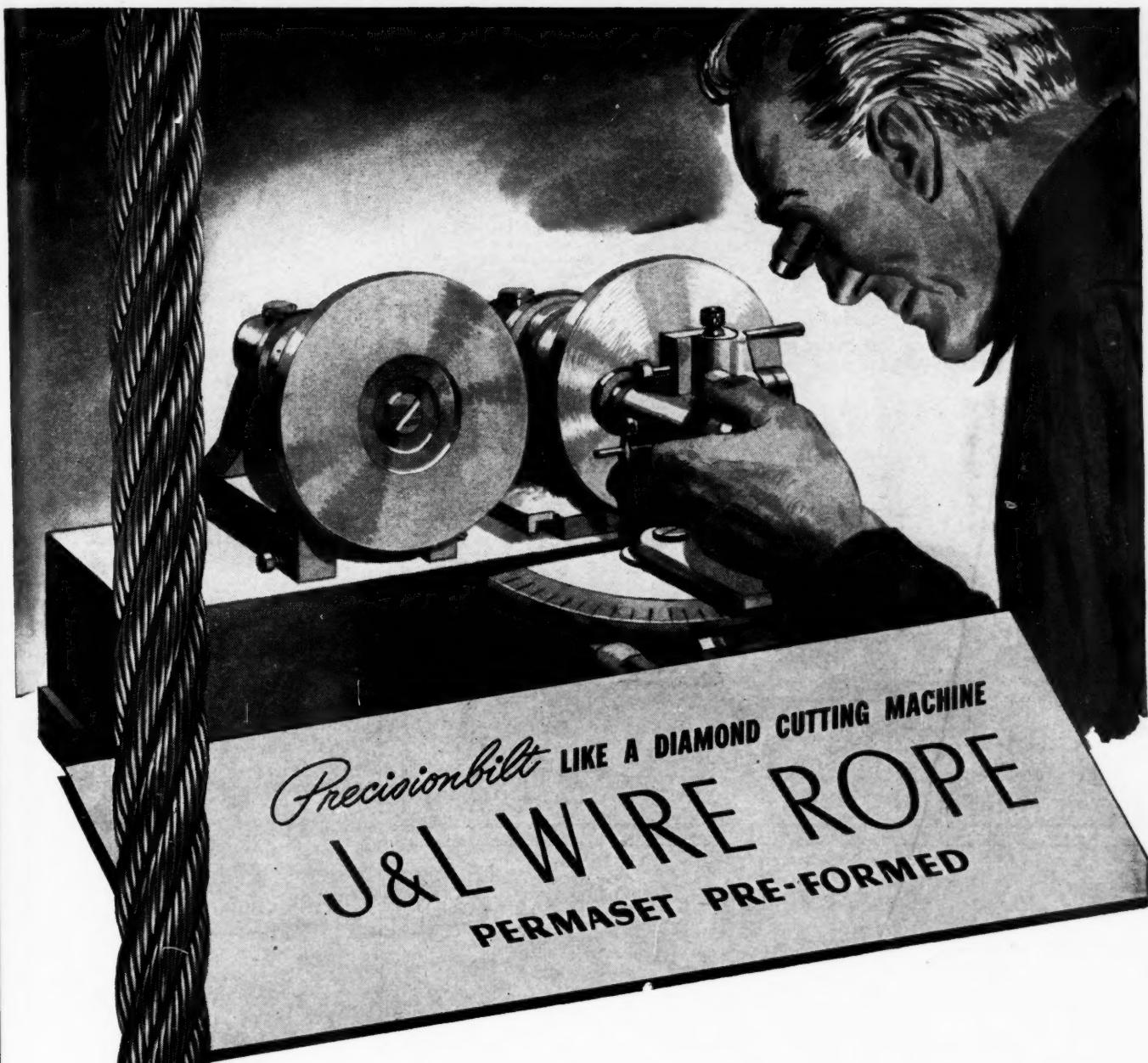
in ratings of 100, 150, 200 and 300 kva., 3 phase, 60 cycles. Choice of combinations of different types of transformers and high- and low-voltage equipment makes them suitable for a wide range of applications, according to the manufacturer.



## Electric Motor

A new type of "packaged" power unit, known as the Link-Belt Electrofluid Drive, presently available up to 20 hp., has been developed by the Link-Belt Co., 307 N. Michigan Ave., Chicago 1. The new unit, the size of which is said to be based on running horsepower and not on starting requirements, is a motorized hydraulic combination consisting of a general-purpose a.c. induction motor flange-mounted on a sturdy housing containing a hydraulic coupling, also called "fluid coupling."

Its output shaft may be direct-connected to the driven machine or to a speed-reducer unit, and it also may be connected to a driven machine through a chain, gear or belt drive. The torque of the motor is transmitted from impeller to run-



Precisionbilt, like a diamond cutting machine, J&L Permaset Pre-formed Wire Rope will give you increased rope life. Just as diamond cutting is done by highly skilled men of long experience, J&L Wire Rope is made by men who have for years produced the best in wire rope.

The long service of J&L Wire Rope on any job reflects the quality of the steel from which it is made—J&L Controlled Quality Steel.

**J&L  
STEEL**

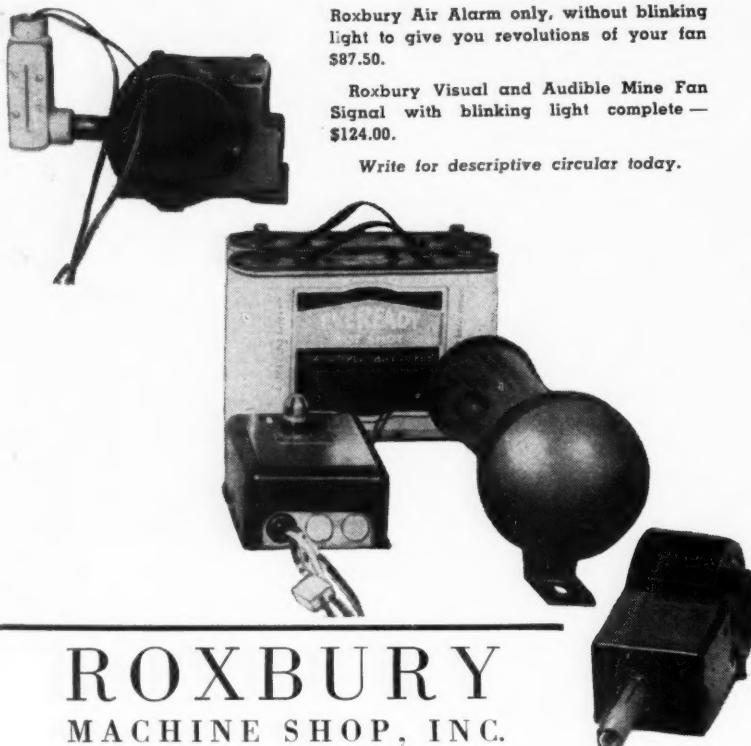
**JONES & LAUGHLIN STEEL CORPORATION**

**GILMORE WIRE ROPE DIVISION**

**PITTSBURGH 30, PENNSYLVANIA**

**J&L Precisionbilt PERMASET PRE-FORMED WIRE ROPE**

# Air Alarm!



**ROXBURY**  
MACHINE SHOP, INC.  
JOHNSTOWN PA.

Roxbury Air Alarm only, without blinking light to give you revolutions of your fan \$87.50.

Roxbury Visual and Audible Mine Fan Signal with blinking light complete — \$124.00.

Write for descriptive circular today.



ner by the fluid in the coupling. There is no mechanical connection between the two elements of the fluid coupling. In effect, the fluid coupling inserted between the motor and its load serves as an automatic clutch, with the fluid acting as a cushion between prime mover and driven machine. Without need of any complicated starting control or special type of motor, the Link-Belt Electrofluid Drive has solved the problem of inadequate torque and excessive high starting current peaks, according to the manufacturer.

## Cap and Blasting Lamp

A new Wheat cap-lamp shot-firing combination said to enable a miner to detonate single shots safely and quickly by using current from his lamp battery while it



## Both Up and Down!

Yes -- you can

*Raise Efficiency  
Pull Down Costs*

and eliminate unnecessary employee fatigue with these light-weight, portable, economical

## Coffing Hoists

DESIGNED FOR  
EFFICIENCY - SAFETY - DURABILITY

Coffing Hoists are sold by leading distributors and supply houses in all principal cities.

CONTACT YOUR DEALER OR WRITE FOR  
FORM 4.



**Coffing Hoist Co.**  
MANUFACTURER OF QUALITY PRODUCTS  
DANVILLE, ILLINOIS

continues to provide light has been announced by the Koehler Mfg. Co., Marlboro, Mass. Instantaneous detonation is secured by inserting the blasting wires in two separate precious-metal contacts in the lamp. The unit eliminates all dry-cell purchases and the time required to locate and connect dry-cell batteries at the face, according to the manufacturer. The light efficiency of the lamp is not affected, it is said.

## V-Belts

Quaker Rubber Corp., Philadelphia, has announced the addition of industrial V-belts to its line of rubber products. The new V-belt line will feature flexibility, heat and abrasion resistance and balance, according to the company.



## -IT'S SIMPLEX JACKS FOR SAFETY

The known safety and dependability of Simplex Jacks accounts for the large number employed in mining operations. The safety factor has always been a basic consideration in designing every Simplex Mining Jack.

Maximum safety is assured by such features as double lever sockets, stronger cadmium-plated springs and links, shorter fulcrum centers, longer and wider rack bar toe lifts, larger trunnion bearings, stronger pawls and reinforced inner-ribbed housings. Where extra strength is needed, it is always present in a Simplex Jack.

Too, Simplex Mine Jacks are correctly designed for convenient operation, and have proved to be consistent man-hour savers — above ground and below. Send for new bulletin — Mines-46.

**ABOVE  
OR  
BELOW  
GROUND**



Above, right. Simplex No. 310A Emergency Jack. 15-ton capacity. Lifts or pushes from any angle.

Above, left. No. 84A General Purpose Mine Jack for working thin seam coal. Capacity 5-tons; height 14"; lift 7".

Right. M8 Mine Roof Jack; 8-tons capacity. Also M16; 16-tons.

BETTER. SAFER. JACKS SINCE 1899

**Simplex**  
LEVER - SCREW - HYDRAULIC  
JACKS

TEMPLETON, KENLY & CO., CHICAGO 44, ILLINOIS

## Car Stop

The new Holmested car stop, said to represent a new and radical change in design and material, is now available from the Wheat Lamp Sales Co., Charleston,

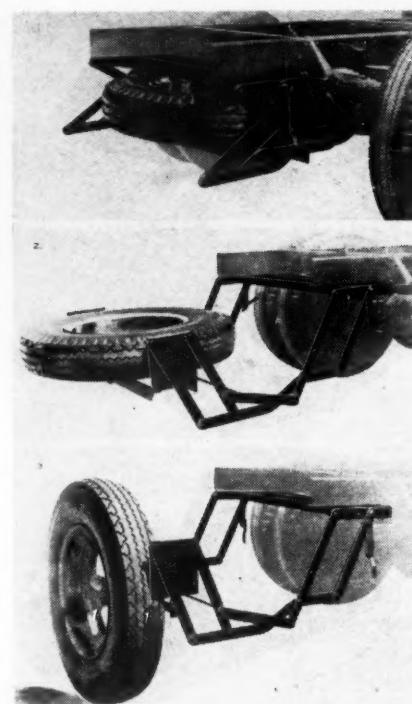


W. Va. Made of a single piece of cast Tisco manganese steel, this car stop is indestructible and has no parts to get out of order, according to the company, and can be installed or removed in only a few seconds. It is available in sizes suitable for 20- to 60-lb. rail.

## Tire Carrier

The Ted Tire Carrier, said to make changing of heavy truck tires and wheels a one-man job, has been developed by the T.E.D. Corp., 928 South Flower St., Los

Angeles 15, Calif. With this carrier, which is bolted to the truck chassis either at the rear or side, the spare tire can be removed and placed in an upright rolling position and the flat similarly returned, without straining or lifting.



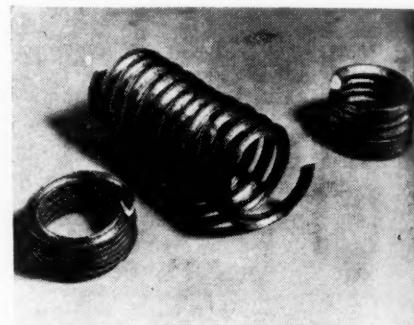
## Electrode

The American Manganese Steel Division, Chicago Heights, Ill., has announced Amsco Resistwear, a recently developed hard-surfacing rod that is said to be a low-cost, high-carbon, chrome-molybdenum, shielded-arc electrode that can be deposited on any ferrous base metal. It will produce, as deposited, hardness of approximately 400 to 500 Brinell, depending upon the degree of dilution from the base metal, according to the manufacturer.

The most recent addition to the Amsco line of "Conservation Welding" products has a wide range of applications where it is desirable to protect ferrous parts subjected to severe abrasion with or without impact with an overlay of a more wear-resistant material. It is stated that Resistwear is an excellent substitute for manganese-steel parts on abrasion applications where there is not sufficient impact to develop the full work-hardening properties for which manganese steel is well known.

## Asbestos Packing

A new addition to the packing line made by Raybestos-Manhattan, Inc., Manheim, Pa., is a V-shaped packing for steam or air rods, valve stems, boiler feed-plungers,



hydraulic rams, etc. It is made from woven asbestos cloth frictioned with high-heat-resisting compound and molded into a V-shape. The V-shape insures automatic sealing of high or low pressure, with a minimum of surface friction on the pressure stroke and no friction on the return stroke, according to the manufacturer.

## Jack

A new Simplex ball-bearing bridge and industrial jack, designed for heavy duty lifting, lowering and supporting, has been introduced by Templeton, Kenly & Co., Chicago 44, Ill. This Simplex No. 2522 jack, the company states, has a capacity of 25 tons and will lift to a height of 10 $\frac{1}{2}$  in., yet it weighs only 140 lb. It lifts high or low work to full rated capacity on a corrugated top cap that is 22 in. above ground level or on a 10-in. square toe lift which is only 4 $\frac{1}{2}$  in. above ground level.

Greater clearance above ground for easier operation is secured because the fully inclosed, dirt-proof ratchet and elevating mechanism are at the top of the jack instead of in the base as in journal jacks. Speedy, smooth, safe operation is assured.

# FLEXIPIPE

The improved flexible tubing for  
mine and tunnel ventilation

This flexible air tubing is ready for immediate, easy installation. On account of its flexibility, it can be put up or taken down in a fractional part of the time required by a more rigid means of face ventilation.

Write for free sample and full information

**BEMIS BRO. BAG CO.**  
412 Poplar Street, St. Louis 2, Mo.

### MORE HAULAGE FOR 20% LESS BATTERY CAPACITY

Double knee-action; better trackability. Floating power; less power consumption. Quick acting footbrake—essential for quick stopping, especially behind loading machines. Brake shoe that follows wheels (due to knee-action). Adjustable Timken Bearings throughout.

**GREENSBURG "MONITOR"**

Franklin County Coal Corporation at Royalton and Herrin, Illinois, have 12 of our Monitor type, storage battery locomotives.

All Greensburg Locomotives are CUSTOM-BUILT to your requirements

THE GREENSBURG MACHINE CO. 101 STANTON ST. GREENSBURG, PA.

# "TONNAGE TOOLS"

by GARDNER DENVER



**It weighs only 31 pounds,** but this Gardner-Denver S.33 Drill is fast and powerful. It's a quality tool—with four-pawl rotation—instead of the two-pawl so generally used in drills of this weight class.



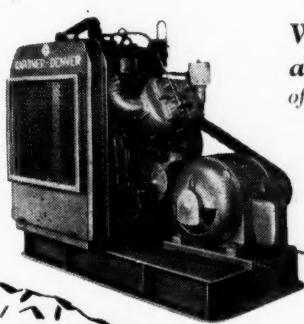
In the Gardner-Denver R104 Stoper, the stinger never feels light—the nose always stays up. This better physical balance means easier handling. In the R104, too, the feed pressure is balanced with the power of the drill itself. No pull on the holding handle.



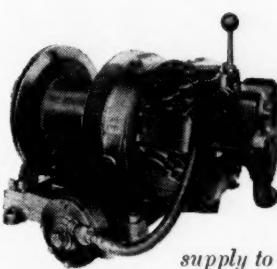
**Weighing 55 pounds,** the Gardner-Denver S.55 Drill is the fastest heavy-duty drill of its class on the market—by actual test. Balanced performance—greater drilling capacity with easy riding and conservative air consumption.



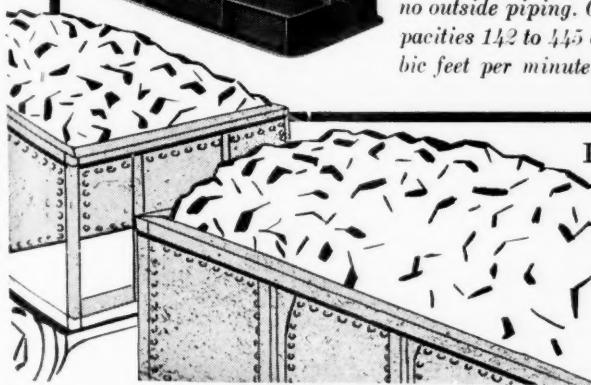
**It's easy on the set-up**—amazingly free from vibration—and automatic in action! The Gardner-Denver CF89H Drifter actually regulates the speed of its own feed in accordance with the type of ground being drilled. No frequent manual adjustments.



**Want a dependable, low-cost source of air power?** Then insist on a Gardner-Denver WB Vertical Water-cooled Compressor. This model takes but little space—requires no outside piping. Capacities 142 to 445 cubic feet per minute.



**There's real safety** for the load—and for the operator—in this Gardner-Denver HKK Safety Hoist! The automatic brake of this hoist is instantly applied if the air supply to the motor is interrupted for any reason! Greatest vertical lift at 80 pounds air pressure—2000 pounds.



For complete information, write Gardner-Denver Company,  
Quincy, Illinois



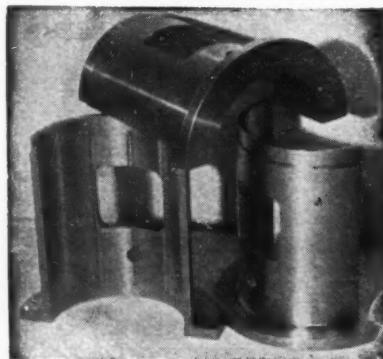
**GARDNER-DENVER**  
*Since 1859*

A MONEY-BACK GUARANTEE  
OF  
LONGER BEARING SERVICE



**AXLE BEARINGS  
JOURNAL LINERS  
BUSHINGS and  
WEARING PARTS**

for coal mining equipment  
a specific formula for each  
application.



**GENERAL ELECTRIC • GOODMAN  
WESTINGHOUSE • SULLIVAN  
OLDROYD • JOY • JEFFREY**

**PROMET CASTINGS**

to your patterns. Any size, shape or section, up to 3,000 lbs. each. Pattern making, designing, machining.

**BAR STOCK**

round, hexagon, square. Rough cast, semi-finished. Cored stock all sizes (by  $\frac{1}{8}$ " steps) from  $\frac{1}{2}$ " minimum core to 12" O.D. and 12" lengths. 6 grades of hardness.

**PROMET MINE  
SPECIAL BABBITT**

Lead base, all virgin metals, perfectly alloyed. Fine, velvety grain. Entire bearing surface wears uniformly, without pitting. Unaffected by moisture. Simply heat to 900°-950° and pour.

Can be repeatedly remelted and reworked. Re-pouring only refines it. No appreciable shrinkage, hence better contact with supporting shell, a more solid, rigid bearing. Supplied in 10 lb. pigs.

**Write for free folders.**

**THE AMERICAN CRUCIBLE PRODUCTS CO.**

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*Prompt deliveries can usually be made from stocks maintained at*

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DENVER, COLOR., Urquhart Service, 16th St. at Blake Phone Main 0331

MT. LEBANON, PA., J. E. Neiser, 720 Roselawn Ave. Phone LE-9876

WHEELING, W. VA., Pelish & Company, 110-111 Fidelity Building Phone 1295

WILLIAMSON, W. VA., Williamson Supply Co. Phone 1200



by chrome-molybdenum-steel thrust bearings, heat-treated seamless alloy-steel elevated sleeve, alloy-steel lifting screw and forged alloy-steel gears, according to the manufacturer.

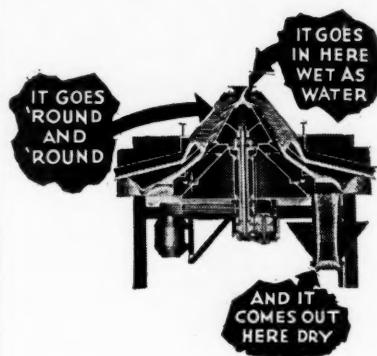
**Flexible Hose**

A new light-weight spiral-wire reinforced hose for ventilation and dust control, known as the "Continuous Wind," has been developed by the American Ventilating Hose Co., 15 Park Row, New York 7. Made of neoprene pre-coated fabrics, the new hose can be manufactured in continuous hose lengths in any required diameter from 1 to 24 in. Construction changes that may be necessary to secure various degrees of flexibility, compressibility, crushing resistance and other physical characteristics are simplified by the new manufacturing process, the company states.

Cuffs, bushes, reducers or flanges can be permanently attached to any of these hose lengths if required, thus greatly facilitating and simplifying the connections on many types of industrial equipment, particularly those having outlets of different size or shape.



**"C-M-I"**  
CONTINUOUS  
CENTRIFUGAL



For dewatering of any size below  $\frac{3}{8}$ ", the most uniform results are obtained from the "C-M-I". At many preparation plants a  $\frac{3}{8}$ " by 0 feed is reduced from over 30% moisture to less than 5% surface moisture. Other installations are dewatering minus 10 mesh sludge or slurry from as high as 82% water in the feed to under 7% surface moisture.

No matter what the maximum size of your fine coal, the "C-M-I" will deliver it drier and at a lower cost per ton than any other mechanical method.

**CENTRIFUGAL AND  
MECHANICAL  
INDUSTRIES  
INC.**

**3600 SOUTH SECOND STREET  
ST. LOUIS 18, MO.**

# KEEPING THE COUNTRY UP-TO-THE-MINUTE ON A PROGRESSIVE INDUSTRY

Recently reorganized for even greater effectiveness, the Bituminous Coal Institute now begins a big new program to win and hold friends for the industry.

B.C.I. now sponsors five hard-hitting campaigns of national advertising, aimed at five vital sections of opinion!

- 1 In *Time*, *Look*, *Newsweek*, *Pathfinder*, *Business Week*, *U.S. News*, and *Iron Age*, Bituminous Coal Institute advertisements present business men and the general public with an up-to-date picture of Bituminous Coal research and how miners work and live.
- 2 In the *Architectural Forum*, *Architectural Record*, *American Builder*, and *Home Owners' Catalogs*, B.C.I. stresses the need of building home chimneys and basement facilities which allow for the efficient use of coal as a domestic fuel.
- 3 In the *Scholastic Teacher*, *Instructor*, *Grade Teacher*, and *Journal of Geography*, B.C.I. advertising corrects common misconceptions by providing teachers with up-to-the-minute supplements to textbook facts on the coal industry.
- 4 In *Editor and Publisher*, *American Press*, *National Publisher*, and *Publishers' Auxiliary*, B.C.I. advertising offers editors and writers every possible service in obtaining helpful facts on all phases of the coal industry.
- 5 In eight retail coal dealer publications, B.C.I. advertising keeps dealers posted on the parts of its national program which tie in with their local efforts to promote coal as a domestic fuel.

B.C.I. advertising is part of a broad, practical public relations program for the benefit of the entire industry. With three years of solid accomplishment behind it, and with a brighter, more helpful future ahead of it, B.C.I. deserves the active support of every forward-looking Bituminous Coal producer.

**BITUMINOUS COAL INSTITUTE**

Affiliate of NATIONAL COAL ASSOCIATION, Washington, D. C.

BITUMINOUS COAL...LIGHTS THE WAY...FUELS THE FIRES...POWERS THE PROGRESS OF AMERICA



### Accidents Cost Employers \$4 . . .



### FOR EVERY \$1 THE INSURANCE CO. PAYS OUT!

The cost of an accident always exceeds the compensation payments. Studies show that it costs an employer approximately \$4 for every \$1 paid out by the insurance company.

True, the \$4 is mostly "hidden costs". Every time an accident occurs, interference with production and loss of time is inevitable. Time spent in giving first aid and medical treatment . . . time lost investigating an accident . . . time required for breaking in new workers . . . general slowdown in production due to weakened morale . . . all these accident effects determine the final cost of an accident to an employer.

### BITUMINOUS SAFETY ENGINEERING SERVICE SAVES

Prevention of accidents means "hidden costs" can be minimized. Constantly developing its methods for nearly thirty years, Bituminous Safety Engineering has come to mean safety and saving throughout the coal industry.

### Security with Service

ASSETS OVER \$15,000,000



**BITUMINOUS CASUALTY  
CORPORATION**  
ROCK ISLAND ILLINOIS

Over 29 YEARS' SERVICE to the Industry

### Hose Couplings

LE-Hi Series 150-B, a new universal-type hose coupling, has a simple, positive, built-in locking device that provides maximum safety for workers using high-pressure air-hose lines, according to the manufacturer, the Hose Accessories Co., Philadelphia 32. This patented device completely eliminates danger of accidental uncoupling of hose lines even under the roughest service conditions, yet permits instant and easy engagement or disengagement of couplings when desired, it is said.

No tools are required to operate LE-Hi Series 150-B and no nails, cotter-pins or other makeshift gadgets are needed, the company states. There is no mechanism to wear out, to be replaced or to get lost. It is not affected by dirt, mud, or rough treatment, according to the manufacturer. These couplings are fully interchangeable with other universal-type hose couplings made to accepted standards. They are made in bronze for resistance to rust and corrosion.

### Rust-Sealing Paint

Speco, Inc., Cleveland, Ohio, has announced a new type of industrial paint, known as Rustrem, which can be applied directly over rusty surfaces without cleaning or scraping. According to the manufacturer, this new black paint seals rusty surfaces and stops rust permanently, regardless of submergence in water or exposure in moist or fume-laden atmosphere.

### Industrial Notes

Link-Belt Co., Chicago, has elected George P. Torrence president, succeeding William C. Carter. Mr. Torrence, who rejoined Link-Belt July 1 as executive vice president, has had 25 years service with the company and from 1944-46 was president of the Cleveland Pneumatic Tool Co.

I-T-E Circuit Breaker Co., Philadelphia, Pa., has elected Harry L. Buck, formerly assistant general manager in charge of its special-products division, treasurer. J. F. Getz, until recently manager of switchgear sales, has been appointed assistant to the president of I-T-E.

American Manganese Steel Division, American Brake Shoe Co., Chicago Heights, Ill., has appointed A. R. Sittig manager of manganese steel sales, and E. L. Quinn assistant vice president in charge of welding products, both with offices at Chicago Heights. E. J. Nist has been named assistant vice president with offices in New York.

Gardner-Denver Co., Quincy, Ill., has appointed as general sales manager G. V. Leece. For the past two years, Mr. Leece, who has been associated with the company since 1922, has been vice president in charge of the export division.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., has promoted Charles F. Codrington from assistant to the manager to sales manager of its blower and compressor depart-

### FOR SAFETY'S SAKE, SUPERIOR COUPLINGS



### Drop Forged Links

Drop forged for strength, Superior Swivel and Single Link Couplings are built to stand the gaff. No welds to let go with resulting wrecks. Superior Couplings on your mine cars will prevent accidents and reduce haulage costs. Order Superior Couplings for your replacements and specify them on new equipment.

DROP FORGED SWIVEL  
COUPLINGS



### PITTSBURGH KNIFE & FORGE CO.

1421 Reedsdale St., N.S.  
Pittsburgh 12, Pa.

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COMFORT...  
COURTESY...  
CONVENIENCE...  
in ST. LOUIS

**HOTEL**  
**Mayfair**



• Built by GOODMAN MANUFACTURING CO.

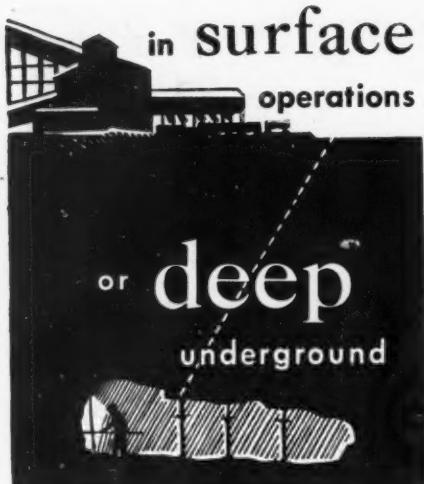
## ROLLING ALIGNMENT FOR QUICK LOADING

The front conveyor cross shaft and the main transmission on the drive shaft to the axle of this 360 Track Type Loader are no sinecures for bearings. They're the places for bearings that can take plenty of punishment on a machine that works in a veritable blizzard of coal dust. That's why the bearings are **SKF** Spherical Roller

Bearings—another way of saying high capacity is always available for useful work which makes it possible for this loader to move high tonnages quickly, easily and economically in both low and high seams. If you're facing a bearing problem, remember this: **SKF** puts the right bearing in the right place.

6106

**SKF**  
BALL AND ROLLER  
BEARINGS  
**SKF INDUSTRIES, INC.**  
PHILADELPHIA 34, PA.



count on dependable

## DUFF-NORTON MINING JACKS for strong, safe, easy operation!



For every job in and around the modern mine, there is a Duff-Norton Mining Jack to speed up your operations; give you safer mining; cut costs and make work easier.

Your industrial distributor will be glad to give you the details on the Standard Duff-Norton Mine Roof and Timbering Jacks and the new Tailor-Made Type Jack Fittings. Ask him also to show you where other Duff-

Norton Jacks can meet your specific requirements!



### WRITE

for descriptive bulletins on the complete line of Duff-Norton Mining Jacks.

**THE DUFF-NORTON MFG. CO.**  
PITTSBURGH, PA.

There is a Representative Near You!

ment, succeeding A. E. Caudle, resigned. Mr. Codrington joined Allis-Chalmers in 1930.

**Davey Compressor Co.**, Kent, Ohio, has elected J. T. Myers vice president in charge of sales and production. During the war he served as engineering officer aboard a mine sweeper in the Atlantic, and was later with the Naval Engineering Laboratories at Annapolis. For the past year, Mr. Myers has been assistant general manager of the company.

**Allied Steel Products, Inc.**, Cleveland, Ohio, has appointed John G. Fitzpatrick, 208 Buckingham Drive, Indianapolis, Ind., direct factory agent in the territory consisting of Ohio, Indiana, Illinois and Michigan.

**The Electric Storage Battery Co.**, Philadelphia, Pa., has purchased a Chicago war plant from the WAA at a price of \$1,000,000. The property consists of approximately seven acres of ground, with buildings containing 183,000 sq.ft. of floor space and will be converted into a plant for manufacturing Exide batteries, as a part of the company's plans for expansion.

**Gulf Oil Corp.**, Pittsburgh, Pa., has named Homer A. Goddard, formerly superintendent of industrial lubricating sales for the area, assistant division manager in charge of industrial lubricating sales for the Pittsburgh division, which includes Western Pennsylvania and West Virginia. He succeeds S. A. Newman, who has been advanced to chief turbine lubrication engineer in the general office.

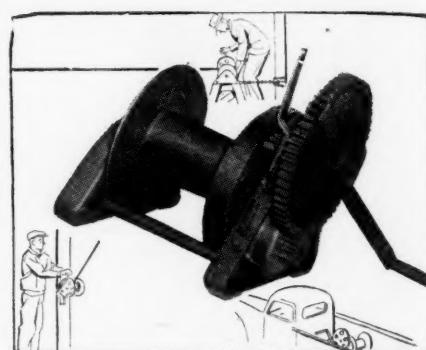
**Torrington Co.**, Torrington, Conn. and South Bend, Ind., has appointed Frank H. Marchand, district manager, Ray G. O'Connell and C. R. Recor, district engineers, in the company's Chicago office. Fred J. Norman has been named district engineer in the Cincinnati office.

**Gorman-Rupp Co.**, Mansfield, Ohio, has named Gilmore Hiett advertising and sales promotion manager. Mr. Hiett was formerly advertising manager for refrigerators and home freezers with the Westinghouse Electric Corp. and was previously advertising manager of the Mansfield News-Journal and the Marion (Ohio) Star.

**Irwin Foundry & Mine Car Co.**, Irwin, Pa., has announced the appointment of D. F. Welch as an engineer to serve mining companies. For the past 24 years he has been associated with the West Penn Power Co. as mining engineer for its coal mines.

**LaPlant-Cheote Mfg. Co., Inc.**, Cedar Rapids, Iowa, has appointed K. V. (Ken) Turner assistant sales manager.

**R. G. LeTourneau, Inc.**, Peoria, Ill., has moved its eastern sales office, under the management of O. A. (Jack) Williams, to 1026 17th St., N. W., Washington 6, D. C. W. B. (Bill) Worden, district sales and service representative for LeTourneau in Southern California and Arizona for the past four years, has been named central sales manager for the company with headquarters in Peoria, succeeding M. E. (Cap) Miller, resigned. Harold F. Stenstrom has been named district sales representative,

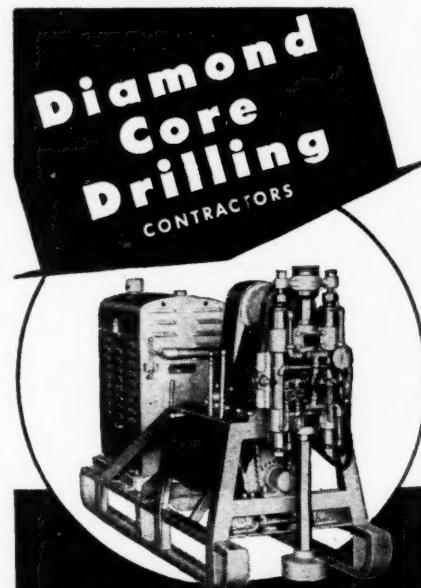


## HUNDREDS . . . OF USES!

**DELIVERING A 5-TON PULL** with only 70 lbs. crank pressure, the new "American" Handiwinch is one of the handiest, most useful tools you can have. Ideal for loading trucks, installing and servicing machines, small construction work, occasional shop service. Weighs only 95 lbs.; all steel; \$75.00 F.O.B. your dealer's warehouse. For full information, write American Hoist & Derrick Co., St. Paul 1, Minn.



**"AMERICAN"**  
**HANDIWINCH**



Testing mineral properties with our light gasoline drills. **SATISFACTORY COAL CORES GUARANTEED.** Ground solidification by our pre-pressure grouting method for shafts. Wet mine areas, horizontal holes for drainage. Electric drills for inside mine drilling.

**MOTT CORE DRILLING CO.**  
HUNTINGTON • WEST VIRGINIA

**MERRICK  
WEIGHTOMETER**

While material is smoothly moving along a conveyor, the MERRICK WEIGHTOMETER keeps a continuous and accurate record of weights. Total weight is available at a glance.

Applied to any size belt conveyor, either horizontal or inclined. The weightometer gives a simplified and dependable record of your production, without interrupting the flow of coal.

Write for Bulletin 375

**MERRICK  
SCALE  
MFG. CO.**  
PASSAIC,  
N. J.

SIGN OF QUALITY

**MARLO**

**PACKING**  
for  
**MINE PUMPS**

Resists acid mine waters. Keeps grit out of stuffing box. Three types.

**MARLO ALL PURPOSE METALLIC PACKING**  
Best ever devised. Will not freeze at 70° below, soft, pliant, like fibrous types, yet easier to handle. Won't cut, score or corrode moving parts.

**"TWIN-TWIST" SEMI-METALLIC PACKING**  
Metal strands twisted with asbestos. Anti-frictional. Durable. Economical. Remarkable temperature up to 550° F.

**"RED WATER" SEMI-METALLIC PACKING**  
Most modern development for all hydraulic applications. A solid-packing vegetable fibre combined with metal strands. Retains form under any conditions.

**THE MARLO COMPANY**  
38 HOWARD ST.  
NEW YORK, N. Y., U. S. A.

with headquarters at Memphis, Tenn.

**Gar Wood Industries, Inc.**, has elected Clifford A. Sharpe, who was appointed works manager last May, vice president in charge of manufacturing. J. E. Brown, formerly in the Chicago sales office, has been appointed manager of the Philadelphia branch, in charge of the products of the hoist and body, winch and crane, and tank divisions.

**Colorado Fuel and Iron Corp.**, Denver, has named Howard J. Jones manager of industrial relations. For the past 12 years he was associated with the Republic Steel Corp. in a similar capacity. Horace J. Jones has been appointed manager of industrial engineering for the company. He was formerly connected with the Republic Steel Corp. for 29 years.

**Republic Rubber Division, Lee Rubber & Tire Corp.**, Youngstown, Ohio, has named G. L. Smith, former traveling sales manager, sales manager and department head. Mr. Smith has been with the Republic organization since 1923. Myron C. Meyer, formerly assistant sales manager, replaces Mr. Smith as traveling sales manager. Mr. Meyer is succeeded by Ralph W. Deemer.

**The Four Wheel Drive Auto Co.**, Clintonville, Wis., has appointed Oscar Dolberg district sales supervisor for lower Michigan and the State of Indiana. Succeeding Mr. Dolberg in the Ohio-Kentucky territory is Elmer Porter, former representative in Illinois. Victor Anderson, assisted by Francis Thompson, will be in charge of the southern part of Illinois and Harry Ringdahl, former specialty salesman in Wisconsin, will handle the metropolitan Chicago area. The States of Missouri and Kansas have been assigned to C. E. Balun, formerly administrative assistant to Mr. Engel in the mid-western FWD zone office at Appleton. The appointment of the Illinois Road Equipment Co., Springfield, Ill., as FWD distributor for the central part of that State, also has been announced.

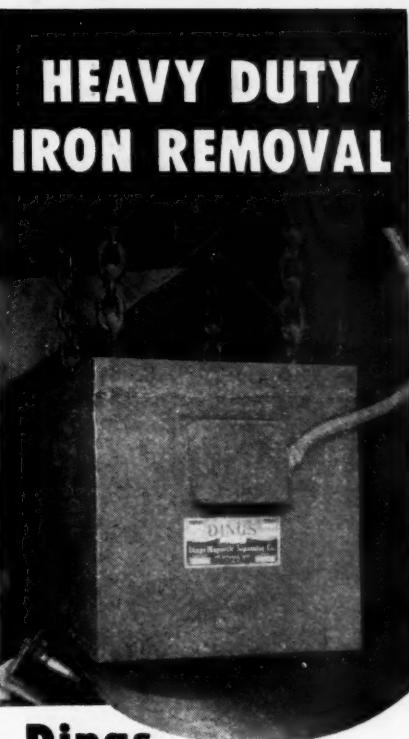
**International Harvester Co.**, Chicago, has announced that Monroe Rooks, former motor truck branch manager at New Orleans has been transferred to the Birmingham general line branch in the same capacity.

**Timken Roller Bearing Co.**, Canton, Ohio, has appointed Elmer Anderson, formerly service engineer in the Milwaukee office, assistant service manager in its Canton office.

**Falk Corp.**, Milwaukee, has named L. H. Billings, formerly production manager, district manager of a newly created sales territory embracing Wisconsin, Upper Michigan and parts of Iowa. B. C. Bugbee has been appointed production-control manager for the company.

**Ideal Industries, Inc.**, Sycamore, Ill., has named Ward R. Schafer general sales manager. Mr. Schafer was formerly vice president in charge of sales for the Edison General Electric Appliance Co., Chicago.

**Kennametal Inc.**, Latrobe, Pa., has appointed four new application engineers for



## HEAVY DUTY IRON REMOVAL

### Dings

#### Rectangular Magnets

**P**ut Dings "High Intensity" Rectangular Magnets over heavily-loaded conveyor belts. Tramp iron is snapped up out of the coal burden...positively protecting your equipment and your customers' stokers. Dings Rectangular Magnets put down a uniform, powerful magnetic field across the entire belt width...Dings design makes a magnet wider than the belt unnecessary...Get complete details on heavy-duty iron removal from Dings today.



A powerful Alnico Magnetic Drill Extractor to save redrilling blast holes when drill rod or bits break off in the hole. Dings Extractors lift up 25 to 40 times their own weight...Easy to use...Can be carried in a pocket...Write for data sheet containing complete information.

**DINGS MAGNETIC SEPARATOR CO.**  
506 E. Smith Street, Milwaukee 7, Wisc.

# Dings

"HIGH INTENSITY"

# Everybody's happy

*when coal is freezeproofed*

with WYANDOTTE  
CALCIUM CHLORIDE

**DEALERS** are dissatisfied when coal arrives frozen in the car. They know that the extra time required to unload it will put them behind on their delivery schedules.

But they're pleased to find coal freezeproofed with Wyandotte Calcium Chloride. This means that it will come out of the car easily, quickly and uncracked. And you'll benefit by their friendly feeling.

Wyandotte Calcium Chloride is economical. You need no special equipment to handle it for freezeproofing. So there's every reason for giving your dealers a break this winter.

Let us tell you more about the advantages of freezeproofing coal with Wyandotte Calcium Chloride. Just send along the coupon.

**WYANDOTTE CHEMICALS CORPORATION**  
*Michigan Alkali Division, Dept. 1776*  
**Wyandotte, Michigan**

Send me literature and further information about the uses and advantages of Wyandotte Calcium Chloride.

Name \_\_\_\_\_

Address \_\_\_\_\_

Title \_\_\_\_\_

**Wyandotte**  
REG. U. S. PAT. OFF.

**CALCIUM CHLORIDE**

**WYANDOTTE CHEMICALS CORPORATION**  
*Michigan Alkali Division, Wyandotte, Michigan*

its district offices, as follow: Delmar E. Baker, Chicago; William L. Chambers and Richard H. Oberholtzer, Detroit; and Leo J. Perrette, Cincinnati. Robert S. Sagers has been named a representative in the Philadelphia area.

## Trade Literature

AVAILABLE WITHOUT CHARGE ON REQUEST TO THE MANUFACTURER

**Perforated Metals, Screens, and Fabricated Metal Products**—Hendrick Mfg. Co., Carbondale, Pa. New 128-page catalog includes actual-size illustrations of 390 shapes and sizes of openings in perforated metal. Metal screens include vibrating, flanged lip, milled-slot and wedge-slot screens, and screens for sizing and dewatering. Several pages are devoted to flights, conveyor troughs and elevator buckets and there is a section on perforated metal grilles, with other pages describing Hendrick's Mitco products—open steel flooring, Armogrids, and Shur-Site treads for stairs—and products of Hendrick's plate and machine tool departments. 19 pages of tables useful for metal workers also are included.

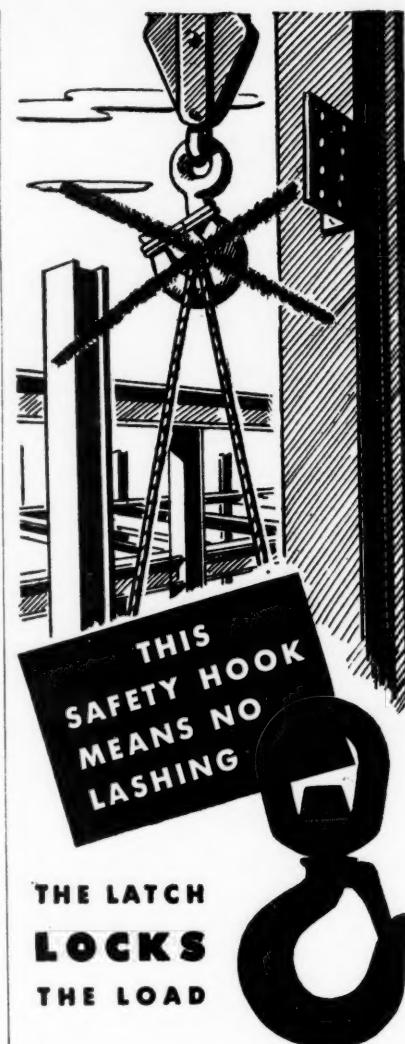
**Feeders**—Hardinge Co., Inc., York, Pa. Catalog No. 33-D illustrates and describes the Hardinge line of constant-weight and volumetric feeders. Particularly featured is the constant-weight feeder which maintains a constant delivered weight of material to the machine being fed and can be adapted to vari-speed or electronic drives, if it is desired to vary the feed rate. Full application and specification data is included.

**Slusher Hoists**—Ingersoll-Rand Co., 11 Broadway, New York 4. Catalog No. 5300 is a complete descriptive bulletin on mine hoists, well illustrated with photographs and cross-sections of all sizes and types available, both air- and electric-powered units. Operational views show hoists on location in many varied applications and numerous diagrams illustrate the hook-ups possible.

**Motor Grader**—Caterpillar Tractor Co., Peoria 8, Ill. Folder No. 9730 outlines the construction and operational advantages of the Caterpillar diesel No. 212 motor grader. It includes basic specifications, and description of the tandem or single drive facilities of the product, the leaning front wheels, the wide variety of blade positions, the extreme positions possible by adjustment and attachments available.

**Wire Rope**—Preformed Wire Rope Information Bureau, 520 North Michigan Ave., Chicago 11. Booklet summarizes the answers of 8,339 wire rope users on their use of and experience with Preformed Wire Rope.

**Power Shovel**—Buckeye Traction Ditcher Co., Findlay, Ohio. Catalog on the Buckeye convertible power shovel, also known as the Buckeye Clipper, pictures and de-



When Laughlin's newly-designed latch — providing about 80% of an ordinary hoist hook's throat opening — replaces rope lashing for securing the load in the hook, you not only speed up the job but also make safety certain. That's because the men who are supposed to lash loads, but often don't are relieved of the responsibility.

Get better acquainted with these sturdy, drop-forged, heat-treated, standard-type hooks . . . made safe by dependable latches and stainless steel springs . . .  $\frac{1}{2}$  to 15 ton safe load.

### WRITE FOR CATALOG

All Laughlin hooks — safety, hoist, cargo, etc. — are heat-treated, drop-forged, weldless. Distributed through mill, mine and oil field supply houses. Write (Dept. 6) for catalog. The Thomas Laughlin Co., Portland 6, Me.

**LAUGHLIN**

THE MOST COMPLETE LINE OF DROP-FORGED WIRE ROPE AND CHAIN FITTINGS



# Who says it isn't luxury?



**IT MAY NOT SEEM TO BE.** Of course you wouldn't use a screen and shovel in mass production. But any inefficient screening method costs you money! It costs you time! It costs you production! Yes...it is a luxury!

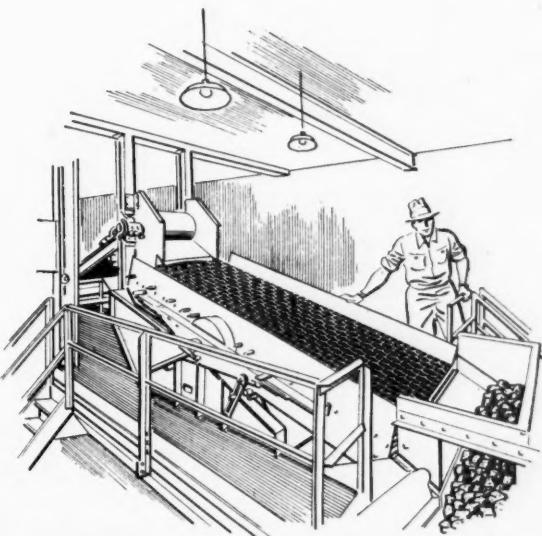
#### BUT WHEN ROBINS GYREX SCREENS ARE PUT TO WORK—

**They do your job cheaper.** They're "Job-Engineered" to screen *your* specific bulk materials . . . help maintain *your* production schedule.

**They do your job faster.** "Circle Throw" action eliminates clogging . . . assures maximum flow.

**They do your job better.** Multiple decks make several sizes in one operation. Screen cloth can be easily changed for new sizing operations.

Yes . . . whatever the problem, you'll find it pays to check with Robins *first*! Write for the "Job-Engineered" answer to *your* screening problem.



"Job-Engineered" to solve your problem  
**CHEAPER...FASTER...BETTER**

## ROBINS GYREX SCREENS

Robins Conveyors Incorporated, Passaic, New Jersey — Division of Hewitt-Robins Incorporated

scribes its features—including vacuum power control, non-clogging crawlers, balanced weight, and fast, positive crowd, hoist, swing and travel. The bulletin demonstrates the unit's quick and ready convertibility from a power shovel to trench hoe, dragline or crane, clamshell, hook block or magnet, or pile driver.

**Wire Rope**—Rochester Ropes, Culpeper, Va. Reference manual and catalog of wire ropes for mining offers fundamental engineering data on wire ropes and general principles governing use and selection and describes various mining applications. Ropes are recommended for shafts, slope

cars, car pullers, mining machinery, conveyors, dredges and strip and open-cut equipment. Rope-selection tables help simplify the choosing of correct ropes for various purposes.

**Concrete-Floor Maintenance**—Stonhard Co., 403 North Broad St., Philadelphia 8, Pa. Folder, "Concrete Floor Maintenance Pays Dividends," covers the protective maintenance of concrete floors with Stonhard Stontop and explains its action in stopping floor "dusting" and protecting against the action of acid, grease, oil and abrasion. Illustrations show the typical problem, solution and result of application.

**Hydraulic-Control Hose**—B. F. Goodrich Co., Akron, Ohio. Catalog leaflet on its high-pressure hydraulic-control hose includes the method for figuring the correct length of hose for various bending radii of various sizes of hydraulic-control hose and describes construction features and manufacturing methods.

**Steel**—U. S. Steel Corp. Subsidiaries, 429 Fourth Ave., Pittsburgh 19, Pa. Catalog presents complete data on the properties, fabrication, and application of U.S.S. Cor-Ten. The various properties of this high-tensile-strength steel, including its high resistance to atmospheric corrosion, and how they may be utilized to best advantage are discussed. Full data on fabrication by standard practices, including five pages on welding, are included. Test data, lists of equipment and users, together with photographs and charts, illustrate the booklet.

**Hose Couplings**—Hose Accessories Co., 2702S North 17th St., Philadelphia 32, Pa. Pocket-sized handbook on the use of hose couplings and fittings planned to aid the user in reducing operating costs and increasing efficiency of his equipment contains hints and information on the care of hose, selection and installation of the correct hose couplings for various types of equipment and other useful data.

**Babbitt Bearings**—Joseph T. Ryerson & Son, Inc., P. O. Box 8000-A, Chicago 80. Wall instruction card, "How to Pour Bearings," illustrates the steps necessary to secure good, tightly lined babbitt bearings and is printed on card stock suitable for hanging in the shop.

**Inspection Cars**—Light Inspection Car Works, Hagerstown, Ind. Folder illustrates the Teetor inspection car built for mine and other use in track gages from 18 in. to 6 ft. Designed for one-man handling, the motive power is provided through a bicycle-like arrangement and the various models will carry up to three men.

**Jacks**—Fields Mfg. Co., Morgantown, W. Va. Bulletin portrays the company's line of roller-bearing Buddy Jacks and lists sizes, capacities and prices for the various models.

**Mine Fans**—Hartzell Propeller Fan Co., Piqua, Ohio. Bulletin 1801 lists the features, construction and specifications of the Hartzell mine fan and illustrates typical installations.

**Rerailers, Pullers, Etc.**—Edelblute Mfg. Co., Reynoldsville, Pa. Catalog No. 7 contains specifications, descriptions and illustrations of the Anchor line of rerailers, puller-jacks, box-car door pullers, track braces and gear and wheel pullers.

**Concentrator**—Humphreys Investment Co., First National Bank Bldg., Denver 2, Colo. Bulletin No. 5 contains detailed description, drawings and flowsheets of the Humphreys spiral concentrator for concentration of ores and cleaning fine coal.

**Potentiometer**—Brown Instrument Co., Philadelphia 44, Pa. Catalog No. 15-10 describes the various types of Electronik potentiometers for temperature recordings.

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Authoritative Valuations, and Reports of  
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11 Broadway, New York 4, N. Y.

### SHERWIN and JANVRIN

Mining Engineers

Pineville, Ky.  
Reports on COAL PROPERTIES  
Planning, Construction & Supervision

### TEMPLETON-MATTHEWS CORPORATION

Designing Engineers—Consultants—Builders  
Practical Application of Skilled Engineering to your Coal Preparation Problems.  
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MINE MECHANIZATION  
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Oliver Building—Pittsburgh, Pa.

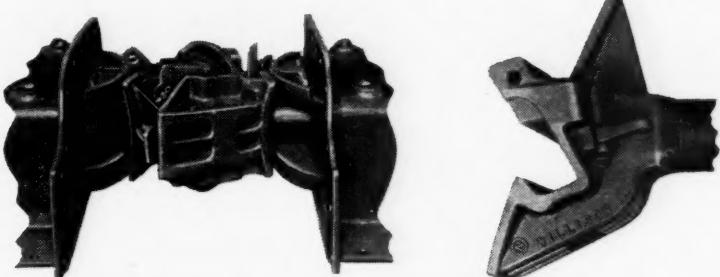
### Consulting engineers

can save you money — by  
saving TIME . . . never  
more important than it is  
today!

# 4 WAYS TO MOVE COAL FASTER ...AT LESS COST!

## 1 WILLISON AUTOMATIC COUPLERS

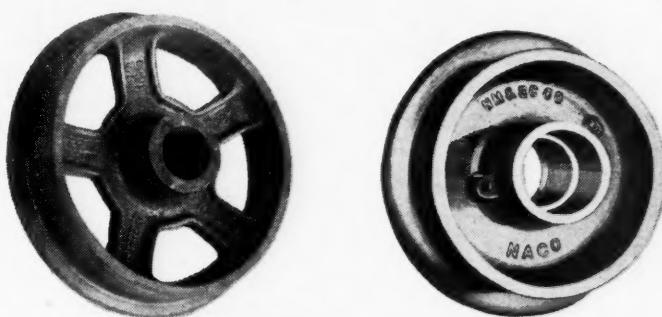
Faster, safer shunting, gathering, handling and dumping.



Made for 4-wheel or 8-wheel cars, for use with simple spring or friction draft gears.

## 2 NACO STEEL CAR WHEELS

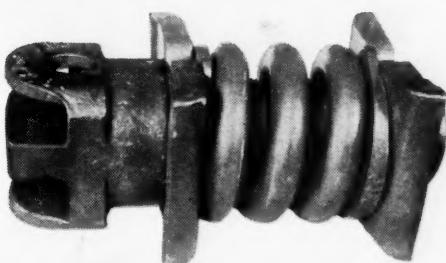
Lighter, stronger, practically eliminate flange breakage.



Available in any size with hubs for plain or roller bearings.

## 3 NATIONAL FRICITION DRAFT GEARS

Sturdy and strong to give long service under severe conditions.



This type of gear permits operation through rotary dump, coupled; it also has provision for self-centering if desired.

## 4 Consult us about Mine Car Equipment

Our engineers will work with you or your car builders, without obligation.



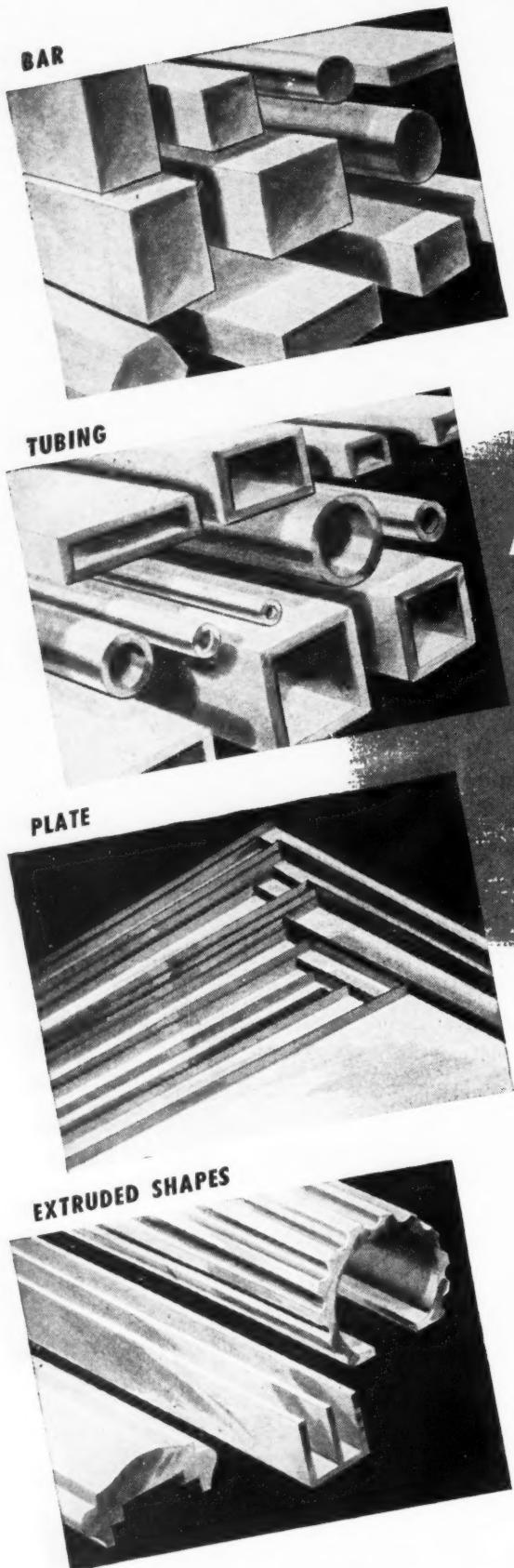
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1868

# NATIONAL MALLEABLE and STEEL CASTINGS CO.

Cleveland, Ohio

SALES OFFICES: Cleveland, Chicago, New York, Philadelphia, Richmond, San Francisco, St. Louis  
WORKS: Cleveland, Chicago, Indianapolis, Melrose Park, Ill., Sharon, Pa.



# ALUMINUM MILL PRODUCTS

**AVAILABLE TO  
FABRICATORS  
*right!  
now!***

Consider your aluminum needs—then get in touch with your nearest War Assets Administration Regional Office to see if we can fill your requirements. Even your highly specialized requirements might be filled from WAA surplus stocks. It costs nothing to find out. Orders are filled quickly and without fuss.

All metals are sold under existing priority regulations.  
VETERANS OF WORLD WAR II are invited to be certified at the War Assets Administration Certifying Office serving their area, and then to purchase the materials offered herein.

Exporters are considered as wholesalers in the purchase of surplus property. Any question on export control should be referred to Office of International Trade, Department of Commerce, Washington, D. C.

## WAR ASSETS ADMINISTRATION

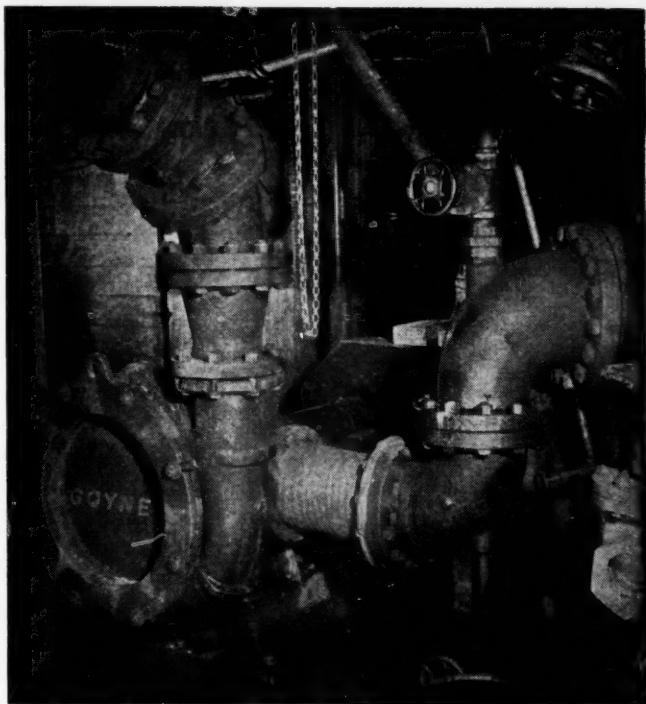
Offices located at: Atlanta • Birmingham  
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157-9

# GOYNE PROCESS PUMPS "PENNSYLVANIA"

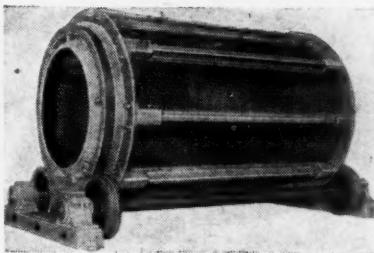


A Sand Pump is only a link in a chain in a coal washing plant, but it can be a strong link if it embodies the following features as does the Goyne.

1. Ease of inspection of all wearing parts. All internal portions are immediately accessible after removing only the rear head of the pump. No suction or discharge piping is distributed.
2. The one packing box of the pump subjected only to suction pressure and is readily kept clean by a low pressure clear water line. Long packing and shaft sleeve life is assured.
3. Impeller clearance is adjusted *while the pump is running*, insuring constant pump capacity so essential for uniform washing.
4. There are twenty-eight possible nozzle assembly combinations for each standard pump. Washery designers like this "adaptability feature" as it helps them out of tight places and simplifies piping.
5. We carry the spare parts stock. Order your replacements when needed. Reduce your inventory by using Goyne Process Pumps.

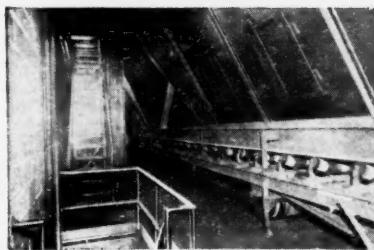
*All inquiries receive prompt  
and careful attention.*

**THE GOYNE STEAM PUMP CO.  
ASHLAND, PA.**



## "PENNSYLVANIA"

ROLLER-MOUNTED BRADFORD COAL BREAKER AND CLEANER, specialized for automatic refuse removal from shovel-loaded full seam coal, while sizing the good coal for cleaning.



## "PENNSYLVANIA"

Bradford - Hammermills crushing, cleaning and delivering to Belt 1000 tons of prepared coal hourly, at one of the world's largest Generating Stations. Patented.



## "PENNSYLVANIA"

REVERSIBLE HAMMERMILLS preparing Bradford-treated coking coals for By-Product Ovens—at the rate of 600 tons per hour. Patented.



## "PENNSYLVANIA"

SLOW SPEED GRANULATOR preparing "Premium" Domestic Stoker Sizes at Mine. This advanced type is also widely used in Industrial Power Plants. Patented.



## "PENNSYLVANIA"

Type K Single Roll Crusher — with automatic tramp iron protection — preparing commercial sizes at mine. Adjustable for 1" to 8" sizing without shut-down. Patented.

World-wide installations of these "Pennsylvania" STEELBUILT types, prepare approx. 300,000,000 tons of Steam and Coking Coals per annum.

Experience gained from these installations during the past 40 years, is at your service.

General Offices: Liberty  
Trust Bldg., Philadelphia



Associated with Fraser &  
Chalmers Engrs. Wks., London

# COAL PREPARATION

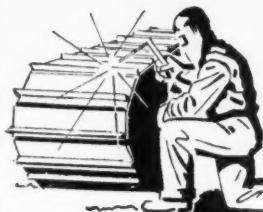


# Parmanco MECHANICAL FEED HORIZONTAL DRILL. TRACTION EQUIPPED

PARIS MANUFACTURING COMPANY  
PARIS, ILLINOIS

## GIVE EQUIPMENT LONGER LIFE HARD SURFACE WITH P&H "ABRASOCOTE"

Now! Two brand-new P&H electrodes to give you longer lasting surfaces—less maintenance costs. Use Abrasocote on parts requiring high resistance to impact and abrasion—and double their lives.



"Abrasocote" is available in two types — Nos. 10 and 20

— to give you the surface hardness jobs require. Easy to use, they operate equally well on AC or DC. Take advantage of their important time, money, machinery saving benefits. Get information from your P&H representative or write us.

### "ABRASOCOTE 10"

Harder than No. 20, it's for parts subject to rolling or sliding abrasion, batter and impact. Applications include tractor treads, drive sprockets, cams, crusher hammer, etc. Rockwell C hardness 35-40.

### "ABRASOCOTE 20"

For high resistance to impact, heat, corrosion, abrasion. Deposit work hardens under impact. Use on high carbon manganese cast steels. Rockwell C hardness 25-35.

*P&H also makes other electrodes in all types and sizes — AC or DC — for welding all steels and for building up and hard surfacing.*

**P&H**

WELDING  
ELECTRODES

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WELDING ELECTRODES • ROTORS • RODS  
ELECTRIC COMBINES • ARC WELDERS • EXCAVATORS

General Offices:  
4540 W. National Ave.  
Milwaukee 14, Wis.

Heat-treated gears are used in this transmission and spur gear reductions, with an ample factor of safety for the operation of machine under all conditions. Link-Belt bearings of extra size are used throughout. Augers are connected to main drive shaft through a self-aligning chuck of ample size, in which is secured the drive shaft by two shear pins which provide sufficient safety to rest of machine. The machine is raised or lowered to a height of 36 inches by jacks on front of machine, and rear of machine is mounted on two pneumatic-tired wheels which also have a 36-inch range of adjustments. The machine permits the drilling of a controlled-angle hole, which makes possible a great saving in the use of explosives through the cantilever effect of this controlled-angle drilled hole.

## HAMMOND'S Latest Type SAFETY EXPLOSIVE BOXES

Approved by Penna. Dept. of Mines

Boxes are constructed entirely of wood, having no metal parts. They are of tongue-grooved and dovetailed construction, having handle for carrying, and are equipped with automatic lock using rubber bands for a spring.

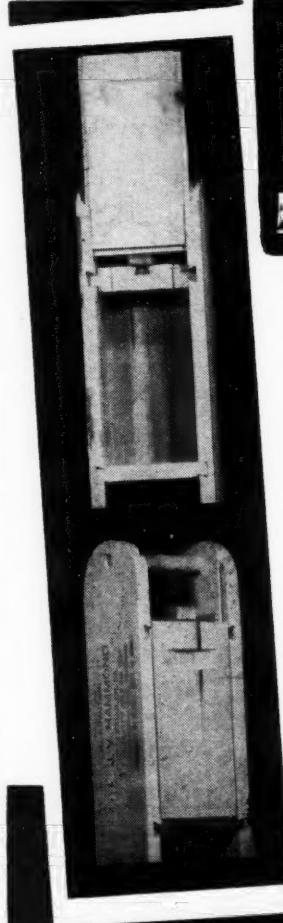
NOTE: There are NO metal parts ... conforming to regulations of the Penna. Dept. of Mines.

Important: Prompt deliveries of these Hammond products: safety explosive boxes — wood tamper poles — shovel handles — robe rollers — trolley poles. Order today or write for further details.

### NET PRICES

#### Boxes Made in These Sizes

No. 9 Powder Box	9 Stick size.....	1.35
No. 12 "	12 "	1.60
No. 16 "	16 "	1.85
No. 20 "	20 "	2.10
No. 36 "	36 "	3.60
No. 72 "	72 "	5.20
No. 6 Detonator Box	2 1/2 x 3 x 6 inside	1.20
No. 8 "	2 x 2 1/2 x 8 "	1.20



**J. V. HAMMOND**  
SPANGLER, PENNA.

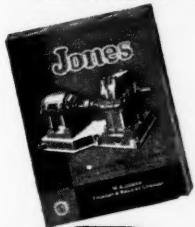
Whether you need **THIS**  
— or **THIS**



## You can get what you want in the complete range of Jones Herringbone Speed Reducers

**Y**OU will find this 128-page catalog of Jones Herringbone Speed Reducers helpful in the selection of reducers in accordance with A.G.M.A.

recommended practice for all conditions of service. Jones Herringbone Speed Reducers are built in single, double and triple reduction types and in every standard ratio



in ratings ranging from 1.25 H.P. to 440 H.P.

All these reducers have heat treated gears, ground shafts and are mounted with anti-friction bearings throughout. Liberal stocks are carried to facilitate shipments.

Catalog No. 70 will save you time and effort in laying out drives that call for Herringbone gears.

**WRITE FOR YOUR FREE COPY**

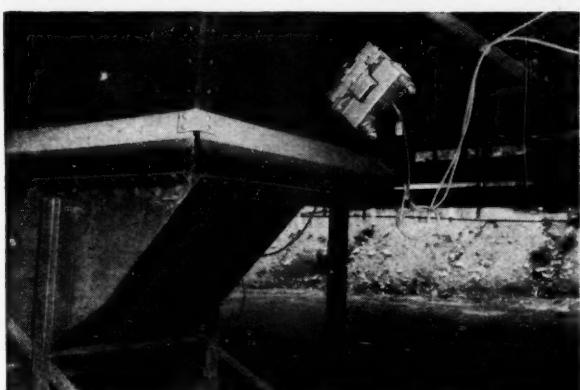
**W. A. JONES FOUNDRY & MACHINE CO., 4401 Roosevelt Rd., Chicago, Ill.**

# Jones

HERRINGBONE—WORM—SPUR—GEAR SPEED REDUCERS • PULLEYS  
CUT AND MOLDED TOOTH GEARS • V-BELT SHEAVES • ANTI-FRICTION  
PILLOW BLOCKS • FRICTION CLUTCHES • TRANSMISSION APPLIANCES

**SYNTRON**  
REG. TRADE MARK  
"Pulsating Magnet"

### ELECTRIC VIBRATORS



#### Keep Coal Bins, Hoppers and Chutes Open and Free-Flowing

**3600** powerful, pulsating vibrations per minute break down arching and plugging—eliminate pounding and sledging.

Available in 8 different sizes—from a little 4 lb. model up to a big 660 lb. model.

Write for Folder I-44, or send us a dimensional sketch, giving gauge of hopper walls, etc.

**SYNTRON CO.**

975 Lexington

Homer City, Pa.

# FLEXLOC



### SELF-LOCKING NUTS

CAN YOU BE SURE THAT A PLAIN NUT WON'T SLIVELY UNWIND ITSELF? If not, then what you need is the All-metal, One-piece "Flexloc", which is a Self-Locking Nut that won't budge, except when a wrench is used.

"Flexloc" packs maximum usefulness in minimum space because it is rugged, locked, compact—and is therefore, becoming increasingly popular and this applies alike to U.S.S. and S.A.E. thread series.

Every thread—including the locking threads—takes its share of the load.

Covers a wide range of tolerances—from low #1 to high #3. Can be used over and over again without losing much of its locking ability.

Being a "stop" nut, it stays locked in any position on a threaded member.

"Flexloc" Thin Nuts are especially popular, because their tensile is so high.

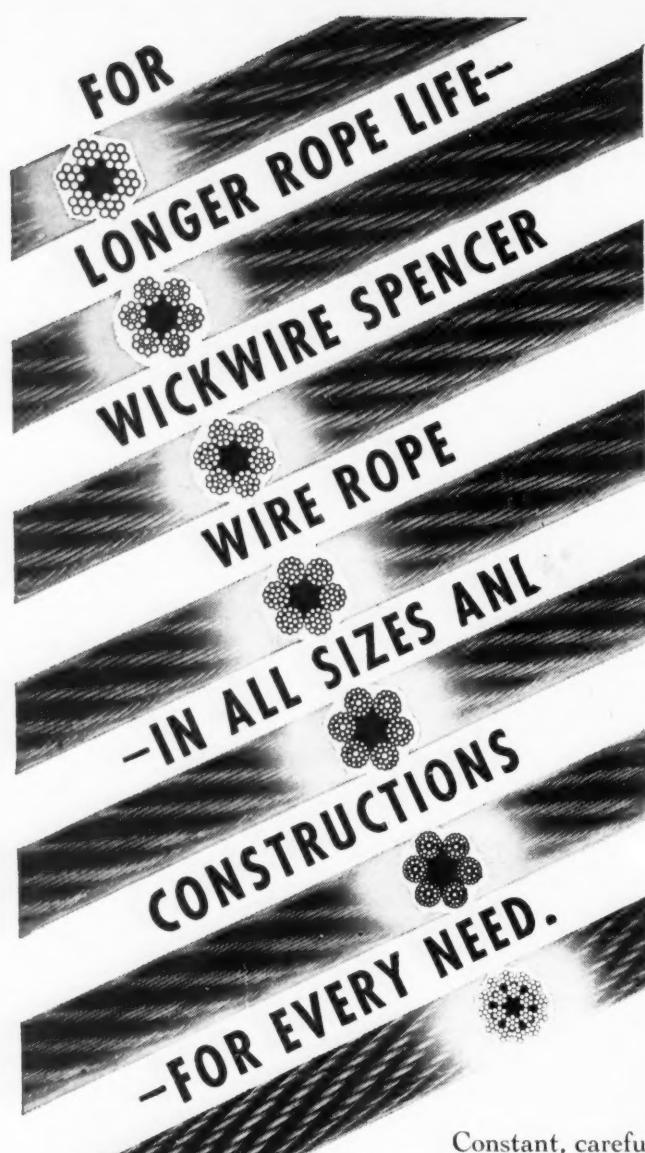
Sizes from #6 to 1" in diameter—millions in use!

Convince yourself with a few free samples.

OVER 43 YEARS IN BUSINESS

**STANDARD PRESSED STEEL CO.**

JENKINTOWN, PA. BOX 738  
BOSTON • CHICAGO • DETROIT • INDIANAPOLIS • ST. LOUIS • SAN FRANCISCO



Constant, careful control through every step of manufacture assures dependable performance, safety and long life in Wickwire Spencer Wire Rope.

#### HOW TO PROLONG ROPE LIFE AND LESSEN ROPE COSTS . . .

Thousands of wire rope users—old hands and new—have found "Know Your Ropes" of inestimable value in lengthening life of wire rope. Contains 78 "right and wrong" illustrations, 41 wire rope life savers, 20 diagrams, tables, graphs and charts.



*For your FREE copy, write  
Wire Rope Sales Office, Palmer, Mass.*

**CF&I** WICKWIRE SPENCER STEEL DIVISION **W**  
*The Colorado Fuel and Iron Corporation*  
THE CALIFORNIA WIRE CLOTH CORPORATION

EASTERN GENERAL SALES OFFICE EXECUTIVE OFFICES WEST COAST OFFICES  
361 DELAWARE AVE., BUFFALO 2, N.Y. DENVER 2, COLORADO OAKLAND 4, CALIFORNIA

## ROOM HOIST CONTROL



Write for catalogs and information on FLOOD CITY Mine Equipment.

FLOOD  
BRASS &

JOHNSTOWN  
4 VIRGINIA ST. W.

CITY  
ELECTRIC CO.

PA.  
CHARLESTON, W. VA.

BELT LACING  
and FASTENERS  
for transmission  
and conveyor belts



"JUST A HAMMER TO APPLY IT"

ALLIGATOR

Trade Mark Reg. U. S. Pat. Offce

STEEL BELT LACING

World famed in general service for strength and long life. A flexible steel-hinged joint, smooth on both sides. 12 sizes. Made in steel, "Monel Metal" and non-magnetic alloys. Long lengths supplied if needed. Bulletin A-60 gives complete details.

**FLEXCO HD**

BELT FASTENERS AND RIP PLATES

For conveyor and elevator belts of all thicknesses, makes a tight butt joint of great strength and durability. Compresses belt ends between toothed cupped plates. Templates and FLEXCO Clips speed application. 6 sizes. Made in steel, "Monel Metal", non-

magnetic and abrasion resisting alloys.

By using Flexco HD Rip Plates, damaged conveyor belting can be returned to satisfactory service. The extra length gives a long grip on edges of rip or patch. Flexco Tools and Rip Plate Tool are used. For complete information ask for Bulletin F-100.

Sold by supply houses  
everywhere



"CONVEYOR BELTS EASILY FASTENED"

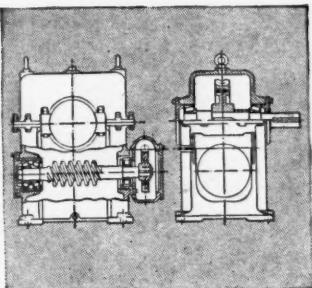
FLEXIBLE STEEL  
LACING CO.

4638 Lexington St.  
Chicago 44, Ill.

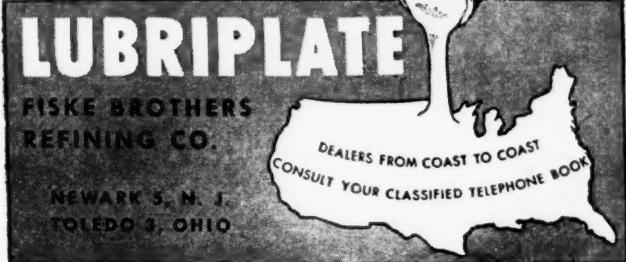
# LUBRIPLATE No. 8

## FOR HEAVY GOING

LUBRIPLATE No. 8 possesses an extremely high film strength and is just the correct density for the general run of enclosed gears (speed reducers). It is especially suitable for worm gears and other types carrying heavy loads. Typical of all LUBRIPLATE lubricants, No. 8 has exceptionally long life.



... Write for the 28 page booklet, "The LUBRIPLATE Film." It tells about LUBRIPLATE Lubricants and where and how to use them.



## TONGUE & GROOVE BLOCKS for safer-faster-cheaper brattice

- Over 90% recoverable for re-use
- Absolutely fireproof
- Blocks inter-lock — no cementing

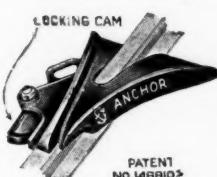
**BELOT** Tongue and Groove Blocks are laid up dry, cutting labor cost in half. Blocks are fireproof and may be installed faster and easier than ordinary brattice. Write for details.



## "Anchor" Rerailers

Designed for mines by a miner. Rerails wheels from either side of rail at once. Are used in pairs. Retracts several derailed cars at one movement. The most practical Rerailer made, and the only one with a locking device. Carry a pair on every locomotive for emergencies.

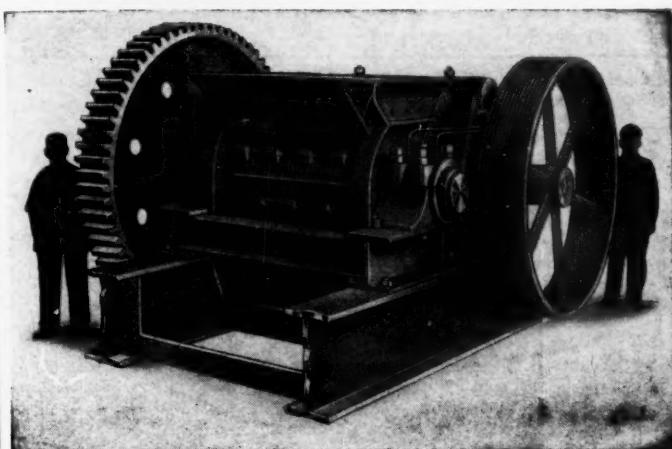
Thousands in World-Wide Use



Patented locking cam holds Rerailer in place; prevents slipping. No tools needed. Easily handled by one man. One size Rerailer fits six rail sizes. Low priced.

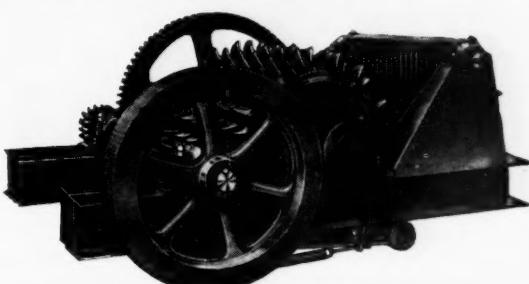
**EDELBLUTE MANUFACTURING CO.**  
Reynoldsville, Penna.

## TWELVE GOOD REASONS FOR CHOOSING **McLANAHAN** SINGLE ROLL MINE REFUSE AND COAL CRUSHERS!



### THE ROCKMASTER AUTOMATIC STEELSTRUT TOGGLE PRIMARY CRUSHER— REMARKABLE POWER AT LOW COST

1. All Steel Constructed
2. Cast Steel Gears
3. Automatic Steelstrut Toggle for Tramp Iron Protection
4. Chilled Alloy Iron or Steel, Interchangeable and Reversible Crushing Plate Liners
5. Hard Surfaced Steel Segment Rolls Easily Replaced Without Dismantling Machine
6. Takes Choke Feed.
7. Dry, Muddy, Wet or Frozen Material Never Packs
8. Lowest Proportion of Flats and Dust Produced
9. Slowest Speed of Moving Crushing Elements
10. Greatest Crushing Range With Opening Easily Adjustable
11. Takes Large Primary Sizes
12. Low First Cost—Low Power Cost—Minimum Repair and Upkeep Costs.



### THE STEELSTRUT SLEDGE-WEDGE CRUSHER HIGHEST TON-PER-DOLLAR VALUE!

Modernize your present plant with modern, dependable, low cost McLanahan equipment. Write for descriptive Bulletins today.

**McLANAHAN & STONE CORPORATION**

Pit, Mine and Quarry Equipment Headquarters

Since 1835

HOLLIDAYSBURG, PENNSYLVANIA

## The greatest help a coal mining man can have—

IF YOU want to make sure of getting your certificate of competency—sure of winning a bigger job with bigger pay, get Beard's great books today and put them to work for you.

In these three books you have a practical, always-on-the-job guide that will help you solve the problems you face every day. Show you what to do, tell you why it should be done.

## Beard's Mine Examination Questions and Answers

3 volumes — \$8.25, payable in three monthly payments

THESE books explain what a man must know in order to become a mine inspector, a mine foreman, assistant foreman fireboss, hoisting engineer, safety engineer, shot-firer, etc.

They give you complete and authoritative information about air and gases, explosives, safety requirements and methods, mechanics, engines, hoisting, drainage, pumping, ventilation, timbering, instruments, and every other detail that the practical mining man must know.

### Can you answer these questions—

What is meant by splitting the air current and what are the advantages derived from such methods?

Can a miner live in air in which the oxygen content is reduced to 17 per cent?

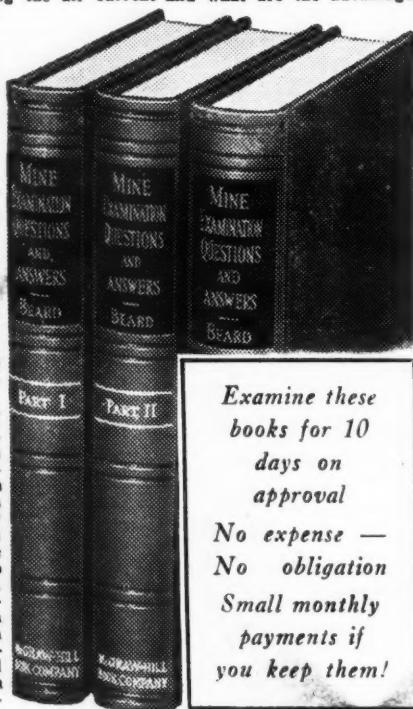
Name five duties imposed on mine foremen by law?

In what time can an engine of 40 effective hp. pump 4,000 cu. ft. of water from a shaft 360 feet deep?

What are the advantages and disadvantages of a gasoline pump, an air pump, and an electrical pump?

What is the estimated tonnage per acre, per foot of thickness, for bituminous coal?

These are but a few of the more than 2000 questions given in Beard's books together with full-correct answers. Hundreds of men have used this method to prepare for higher, better jobs. You can too, if you have the Beard books and plan to use them systematically. They are the best investment that a mining man can make—not only as an aid for passing examinations but as practical reference volumes on everyday mining operations.



Examine these books for 10 days on approval  
No expense — No obligation  
Small monthly payments if you keep them!

### McGRAW-HILL ON-APPROVAL COUPON

McGraw-Hill Book Co., Inc., 330 West 42nd St., New York  
Send me, charges prepaid, Beard's Mine Examination Questions and Answers, 3 volumes, for 10 days' examination. If satisfactory I will pay \$8.25 at the rate of \$2.25 in ten days and \$3.00 per month. If not wanted I will return the three volumes postpaid.

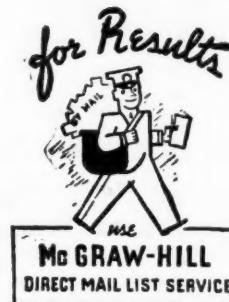
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McGraw-Hill Mailing Lists, used by leading manufacturers and industrial service organizations, direct your advertising and sales promotional efforts to key purchasing power. They offer thorough horizontal and vertical coverage of major markets, including new personnel and plants. Selections may be made to fit your own special requirements.

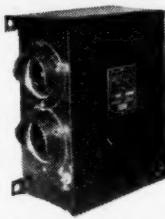
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330 WEST 42nd ST. NEW YORK, N.Y.



## NUSSCO AUTOMATIC MINE SIGNALS

For Main Haulage • Prevent Collisions  
Save Trip Time

A two wire cable connects two or more signals together into one block. Only one signal can show proceed on the entrance of a trip, all other signals show stop.

Low in cost • Easy to install • Write for Catalog

NACHOD & UNITED STATES SIGNAL CO.  
INCORPORATED  
4771 Louisville Ave., Louisville, Ky.

## CESCO ELECTRICALLY OPERATED TRACK SWITCH

Thrown by Motorman

Operates Switch Safely • Saves Time and Money

This modern track switch is thrown swiftly and safely by motormen as they sit in their cabs. It saves time and money, and is fool-proof and dependable!

Over 40 years experience manufacturing  
ELECTRIC TRACK SWITCHES

Write for Catalog

CHEATHAM ELECTRIC SWITCHING DEVICE CO.  
INCORPORATED

4780 Crittenden Drive, Louisville, Ky.

**PERFORATED METAL  
COAL MINING SCREENS**

Manufactured exactly to your specifications. Any size or style screen, in thickness of steel wanted with any size perforation desired. We can promptly duplicate your present screens at lowest prices.

CHICAGO PERFORATING CO.  
2443 West 24th Place  
CHICAGO, ILLINOIS  
Canal 1459

## FLORY HOISTS



Manufacturers of Steam, Electric and Gasoline Hoists of all types: also parts for all model Flory Hoists.

FLORY MANUFACTURING COMPANY,  
BANGOR, PENNSYLVANIA

If there is

**anything you want...**

that other readers of this paper can supply

or —

**anything you have of interest...**

to other readers, advertise it in the

### SEARCHLIGHT SECTION

(Classified Columns)  
of this paper



## TOUGH FLOOR PROBLEM?

Solve it with STONHARD CONCRETITE, the permanent way . . . Resistant to acid, oil, grease and severe abrasion . . . flint, hard and durable.

Our trial offer "Satisfaction or No Charge".  
Return this coupon for more information.

STONHARD COMPANY  
814 Terminal Commerce Bldg., Phila. 8, Pa.

Please send us a free copy of your new folder including details about STONHARD CONCRETITE.

Firm ..... Title .....  
Mr. .....  
Address .....  
City ..... Zone ..... State .....

## STONHARD COMPANY

Building Maintenance Materials

Serving the Railroads, Public Utilities and Industries Since 1922

401 N. BROAD ST., PHILADELPHIA 8, PA.

"We look  
into the  
Earth"

**CORE DRILLING**  
—anywhere!



**PENNSYLVANIA**  
**Drilling Co.**  
DRILLING CONTRACTORS

1205 Chartiers Ave. PITTSBURGH, PA. WALnut 5816

# SEARCHLIGHT SECTION

## EMPLOYMENT • BUSINESS

## OPPORTUNITIES

## EQUIPMENT—USED or RESALE

### UNDISPLAYED RATE:

*Not available for equipment advertising 10 cents a word, minimum charge \$2.00. (See 1 on Box Numbers.)*

**POSITIONS WANTED** (full or part-time individual salaried employment only),  $\frac{1}{2}$  the above rates.

**PROPOSALS**, 50 cents a line an insertion.

NEW ADVERTISEMENTS received by 10 A. M. January 3rd will appear in the January issue, subject to limitation of space available.

### POSITIONS VACANT

**WANTED:** LARGE metal mining organization with coal mine in South America desires Mine Engineer with technical education and several years coal mine experience. Age 25-35. Opportunity for advancement; liberal three-year contract; transportation; married quarters. P-384, Coal Age, 330 W. 42nd St., New York 18, N. Y.

**WANTED:** LARGE metal mining organization with coal mine in South America desires two shift-bosses, preferably with technical education and one or two years coal mine experience. Age 25-35. Opportunity for advancement; liberal three-year contract; transportation; married quarters. P-385, Coal Age, 330 W. 42nd St., New York 18, N. Y.

### EMPLOYMENT SERVICE

**EXECUTIVE, TECHNICAL, Sales, Office.** Qualifications of selected applicants submitted without charge or obligation. Licensed and bonded. National Employment Service, 200 Time Bldg., Minneapolis 3, Minn.

### POSITION WANTED

**PRODUCTION MANAGER**—Executive's Assistant: Graduate mining engineer desires position with coal mining company interested in mechanization. Extensive experience in all types of coal mining equipment, production methods, costs, time and operation studies, supervisor's training and labor relations. PW-383, Coal Age, 526 N. Michigan Ave., Chicago 11, Ill.

### BUSINESS OPPORTUNITIES

**FOR SALE:** Western Pennsylvania 900 acres of land approximately 500,000 tons of coal (possible to buy adjoining acreage of coal). Mine opened and railroad siding available—also oil and gas lease \$25,000. Write BO-372, Coal Age, 330 W. 42nd St., New York 18, N. Y.

**FOR LEASE** on royalty basis: Over 1000 acres unmined coal. Located near Marissa, Ill., 45 miles Southeast of St. Louis, Mo., on the Illinois Central Railroad. Surface—Approximately 4 acres around shaft. Underground—Rock roof at shaft, 2 or 3 trolley motors, cutting machines, pit cars and other equipment. Contact Alberta Hamilton, 507 South Park Avenue, Marissa, Ill.

WOULD LIKE to contact someone ready to do strip mining. Address Box 70, Tazewell, Va.

**COAL MINE** Western Pennsylvania Six ft. Pittsburgh vein drift mine; fully equipped; 99 year lease; railroad siding; state highway; employ ten; two cutting machines; well drained; open light; can increase tonnage. Apple Company Brokers, Cleveland, Ohio.

**COAL MINE** Western Pennsylvania 106 acres Venango County; 46 inch vein; shaft mine; all modern equipped; same owner nine years; sales \$3500 month; can increase; \$10,000 stock; lifetime lease; retiring; price \$17,000 plus stock. Apple Company Brokers, Cleveland, Ohio.

10,000 ACRES coal land Eastern Kentucky; 3 seams excellent coal. Located on L. & N. Railroad. E. M. Huffman, Box 563, Huntington, West Va.

We are principals acting in our own behalf willing to

**PAY YOU IMMEDIATE CASH**

For ASSETS or CAPITAL STOCK of . . .

- INDUSTRIAL PLANTS
- MFG. DIVISIONS or UNITS

All transactions held in strictest confidence. Personnel retained wherever possible.

ADDRESS: Box 1231  
147 West 42nd St., New York 18, N. Y.

### INFORMATION:

BOX NUMBERS in care of any of our New York, Chicago or San Francisco offices count 10 words additional in undisplayed ads.

DISCOUNT OF 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

### DISPLAYED RATE:

The advertising rate is \$7.25 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

AN ADVERTISING INCH is measured  $\frac{1}{6}$  inch vertically on one column, 3 columns—30 inches —to a page.

C.A.

16,500 acres land with estimate of 300,000,000 tons of coal. \$10.00 per acre. Also coal land suitable for strip mining. Complete details upon request.

**G. B. LORRAINE**  
Law Bldg. Richmond 19, Va.

**WANTED**

### WANTED

**3/4 to 4 yard Shovels**  
**2 to 8 yard Draglines**

**FRANK SWABB**  
**EQUIPMENT CO., Inc.**

HAZLETON, PA.

Telephones: 4910J and 4911

### Air Compressors Wanted

Horizontal Water Cooled—100 CFM or larger; also Gasoline or Diesel Driven Portable Machines

**L. W. BAUER**  
North Bergen, N. J.

**WANTED**  
One Stripping Front Boom and Stick for a Lorain #79 or #80 not less than a 30 ft. boom.

and  
**One Bulldozer D7 or DR.**  
Please state the Price, Condition, and Location for Inspection. Write to  
The IMPERIAL COAL & CONSTRUCTION Co.  
BOX 305, RUPERT, West Virginia

### FOR SALE

**COPPER TROLLEY WIRE**

4/0 Grooved. Also 2/0 and 3/0

**COPPER FEEDER WIRE**

500,000 CM Bare and Insulated

New Fabricated Landing Mats for re-inforcing, fence, mine roadways for shuttle cars, etc.

Safety Spectacles, Full Vue.  
Asbestos Mittens.

**MANSBACH METAL COMPANY**

Logan, W. Va. Phone 1071

1—Heyl & Patterson 60" Belt Conveyor 26 ft. centers, complete with Jones Reducer, 10 HP. Westinghouse Motor, 440 volts, 3 phase, 60 cycle, 1200/600 RPM, controls.

3—Jeffrey 35A Shortwall Mining Machine, 250 volt DC.

1—Ironton Battery Locomotive 36" gauge 200 HP. Speed Reducer 39 to 1

3—Jeffrey 24B Mining Machines, 250 volt DC.

1—Sullivan CE9 Mining Machine, 440 volts, 3 phase, 60 cycles.

**BERRETTINI ELECTRIC CO.**

376 N. Main Street Plains, Pa.

### Practically New

**2 ALLIS-CHALMERS CRUSHERS**

4"x6" Dodge Type

**MAGNA MANUFACTURING CO., INC.**  
444 Madison Avenue New York 22, N. Y.  
Tel. Eldorado 5-4136

B-Erie 1 $\frac{1}{4}$  yd. gas-air shovel, GA-3, rebuilt.  
B-E 52B 2 $\frac{1}{4}$  yd. dragline-shovels; elec., Diesel.  
Monighan Walker 4 yd. Diesel dragline.  
Marion 350 electric 7 yd. shovel.  
Bucyrus-Erie 50B 2 yd. steam shovel-dragline.  
Marion 20 yd. dragline, electric.  
25-yd. tractor-truck-trailers, gasoline, (3).  
Euclid 6 yd. bottom dump crawler wagons (8).  
Porter, Vulcan 18 ton stm. locos, 36" reb.  
Locos., 8, 14, 27, 35, 67 ton; 24", 42", 56 $\frac{1}{2}$ ".  
H. Y. SMITH CO., 828 N. B'way Milwaukee 2, Wis.

**Somebody—Somewhere,**

needs your idle equipment! Reach that buyer quickly and economically thru the

**"SEARCHLIGHT SECTION"**  
The meeting place of Used Equipment Buyers and Sellers



# For High-Speed STRIPPING or LOADING Equipment

**Phone "Collect"  
To ECONOMY CO.**

## And Use Our "LEASE-BUY" Plan

Don't delay the Stripping job—or the Loading which is so essential also to HIGH-SPEED production of Big Tonnage.

By using our "LEASE-BUY" Plan you may HIRE the right equipment for your Stripping job and then "Pay-as-You-Go", on the purchase.

Our lists cover Draglines, Shovels, Cranes, Tractors and other Stripping, Digging, Loading and Hauling Equipment—from "Coast-to-Coast".

We'll supply the right machines for your job and help you get quick shipments. We accept "Collect" phone calls from responsible Stripping contractors—"Day or Night, any hour"—Put in your call to-day.

- 1—2 yd. Lorain 78 Diesel Shovel and Dragline Combination. Serial number in 10500's.
- 1—2½ yd. Bucyrus-Erie 52B Shovel and Dragline Combination. 3 yd. dragline bucket. Serial number in 1100's.
- 1—2¼ yd. Lorain 82 Diesel Shovel and Dragline Combination. Serial number in 14300's.
- 1—2½ yd. Koehring 801 Shovel and Dragline Combination. Buda Diesel Engine.
- 1—2½ yd. Northwest 80 Shovel and Dragline Combination powered by Twin City Gas Engine.

### SPECIAL

S-653 2½ yd. Bucyrus-Erie Model 48B Diesel shovel and dragline combination. Serial #14777. 2¼ yd. Dipper bucket. Brand new 80' boom. 2½ yd. dragline bucket. Recently rebuilt. \$25,200. Oregon.

One Bucyrus-Erie 52B Diesel combination. Serial No. 11,500s. Completely overhauled. \$30,600. California.

2½ yd. Lima 901 dragline. 80' boom. New in 1938. Waukesha Diesel engine. Complete light plant. W. Virginia. Price on request.

- 2½ yd. Lorain Model 95D shovel and dragline. Cummins Diesel engine. 65' boom. New cab. \$24,950. Tennessee.
- 3 yd. Monighan walker dragline Model 3T. 75' boom. 150 HP G.E. motor. 500' cable. Good condition. \$14,500. Illinois.
- 3 yd. Manitowoc crane. Model 3000E. Gas operated. Built in 1938. 60' boom. 20' jib. Extensions to 110' can be added to boom. \$22,500. Texas.

**2½ yd. Manitowoc dragline. 80' boom. Diesel powered. A good buy. Write for information.**

### SPECIAL

S-659 3 yd. Marion 38A Diesel dragline. Serial #7168 Waukesha-Hesselman engine. 75' boom. 1940 machine. \$21,000. Louisiana.

3 yd. Monighan 3T dragline, new type walkers. Serial No. in the 300s. 80' boom. Extra parts. Two good Page buckets. One extra motor for spare parts. Indiana. Price on request.

**2 yd. Marion Shovel—entirely rebuilt and guaranteed. Shipped from factory in 1941. Price . . . \$28,500.**

### SPECIAL

S-661 3½ yd. Lima 1201, Cummins Diesel, dragline, 80' boom. Koehler light plant. 3½ yd. buckets. New in 1942. Completely overhauled. \$48,000. Kentucky.

4 yd. P&H model 900 dragline with Atlas Diesel motor. 80' boom. \$25,750. Pennsylvania.

### SPECIAL OFFERINGS

5 yd. Bucyrus-Erie Model 120B shovel. Full electric power. Rebuilt & guaranteed. Location and price on request.

7 yd. Marion Model 350 electric shovel. 80' boom and 52' stick. Rail-truck mounting. Ward Leonard power plant complete with a quantity of new and used parts. Price on request.

20 yd. Marion Model 5600 dragline. Electric powered AC current. 200' boom. \$75,000. New parts. 20 yd. brand new dragline bucket, ready for immediate shipment. Price on request.

**7 yd. Marion Model 350. Shovel boom 80'. Dipper stick 52'. 7 yd. dipper bucket. Price good. Phone or write for information.**

# ECONOMY COMPANY, INC.

**49 Vanderbilt Ave., N. Y. C.**

Tels. MURRAY HILL 4-2294 - 8292 - 2295 - 2296

**FOR  
IMMEDIATE  
DELIVERY  
OF  
RUBBER PRODUCTS**

Conveyor Belting...Transmission  
Belting...Elevator Belting...Fire,  
Water, Air, Steam, Suction or  
Welding Hose, etc.

CALL, WIRE or WRITE  
**CARLYLE**  
THE  
RUBBER HEADQUARTERS

CARLYLE RUBBER PRODUCTS ARE  
NEW, GUARANTEED & LOW PRICED

**CONVEYOR BELTING**

**ABRASIVE RESISTANT COVERS**

Width	Ply	Top-Bottom	Covers
48"	8	1/8"	— 1/16"
42"	5	1/8"	— 1/16"
36"	6	1/8"	— 1/16"
30"	6	1/8"	— 1/16"
30"	5	1/8"	— 1/16"
24"	5	1/8"	— 1/32"
24"	4	1/8"	— 1/32"

Inquire For Prices - Mention Size and Lengths

**TRANSMISSION BELTING**

HEAVY-DUTY FRICTION SURFACE		
Width	Ply	Width
18"	6	10" — 6
16"	6	10" — 5
14"	6	8" — 6
12"	6	8" — 5
12"	5	6" — 6

Inquire For Prices - Mention Size and Lengths

**ENDLESS "V" BELTS**

"A" WIDTH All Sizes | "D" WIDTH All Sizes  
"B" WIDTH All Sizes | "E" WIDTH All Sizes  
"C" WIDTH All Sizes Sold in Matched Sets

Inquire For Prices - Mention Size and Lengths

**PROTECT THAT PLANT  
FIRE HOSE**

APPROVED SPECIFICATION HOSE EACH LENGTH WITH COUPLINGS ATTACHED		
Size	Length	Per Length
2½"	50 feet	\$28.00
—	25 "	16.00
2"	50 "	23.00
—	25 "	13.00
1½"	50 "	20.00
—	25 "	11.00

Specify Thread On Couplings

**CARLYLE RUBBER CO., INC.**

62-66 PARK PLACE

C. B. LOCKE CO.  
P. O. BOX 3227  
TEL. 38-136  
CHARLESTON W. VA.

**NEW and  
REBUILT**

**Electrical Equipment**

Converters, Motor Generator Sets, A. C. & D. C. Motors,  
Control Equipment and Transformers.  
We build equipment to fit your requirements. Over 25 years  
engineering background.

**PIPE-MACHINERY-GAS ENGINES  
AIR COMPRESSORS-DIESELS-PUMPS**

Some Steam Engines and Boilers available only slightly above the metal price

**BRADFORD SUPPLY COMPANY**  
WAYNE, WOOD COUNTY, OHIO

Near Toledo

**LOADING MACHINES**

- 5—L-400 Jeffrey, 250 volt DC.
- 3—7-BU Joy, 250 volt DC.
- 15—5-BU Joy, 250 volt DC.
- 2—#3 Myers-Whaley Automat, 250 volt DC.

**ELECTRIC LOCOMOTIVES**

- 2—13-ton Jeffrey, 250 volt DC.
- 3—10-ton Goodman, 250 volt DC.
- 3—15-ton Goodman, 250 volt DC.
- 4—6-ton Gen. Elec., HM-803, 250 volt DC.

**MINE CARS**

- 500—5-ton all steel, end dump, 44" gauge, Timken bearing 18" wheels.
- 400—4-ton rotary dump, 42" gauge, Timken bearing 14" wheels.

**MISCELLANEOUS**

- 1—3-track Link-Belt Steel Tipple, late type, with coal washer, cap. 300-ton per hour. Other 3, 4 and 5-track steel tipples.
- 1—600 H.P. Shaft Hoist with conical drum, 600' of 1½" rope.
- Other hoists from 150 to 1000 H.P., AC and DC Shortwall Mining Machines, Motor Generator Sets and Rotary Converters.

**COAL MINE EQUIPMENT  
SALES COMPANY**

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L. D. Phone-34

**MINING MACHINES**

AC or DC  
REBUILT & GUARANTEED  
FOR IMMEDIATE SHIPMENT

**COAL CRUSHERS**  
Single & double roll.

Electric Coal Drills, Mine Fans, Vibrating Screens, Electric Generators, Motors, etc.

CONVEYORS—Belt and Drag. Also gravity conveyors, bucket elevators, etc.

The INDUSTRIAL EQUIPMENT Corp.

(Established 1902)  
705 First National Bank Bldg.,  
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**SPECIAL OFFERING**

**Immediate Delivery**

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Large stocks, all sizes  
attractive prices

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In Pittsburgh  
FOR REBUILT MINING EQUIPMENT

#### MINING MACHINES

1-35 B Jeffrey 250 v. Permissible, 7½" bar.  
1-35 B Jeffrey 500 v. Permissible, 7½" bar.  
12DA Goodman 50 HP 250 v. 6" Bar, rebuilt.  
2-35L Jeffrey Low Vein 6' AC Shortwall.  
1-35 B Jeffrey 250 v. 36/42" Ga. 6' bar.  
2-12 G3 Goodman AC 220/440/3/60 shortwall 6" bar.

#### STORAGE BATTERY LOCOMOTIVES

2-6 Ton G.E. permissible 36/44" Ga. HM 825 BB Motors, with Edison Batteries.  
4 Ton 36" Ga. Atlas 2 BB Motors.  
5½ Ton Type D Ironton, 42" Ga.

#### Haulage & Gathering Locomotives

13 Ton Westing. 250 v. 36" or 40" Ga.  
13 Ton Westing. Bar Steel 500 v. 40/42".  
10 Ton Jeffrey MH 110, 250 v. 36/42" Ga.  
8 Ton West. 250 v. 42" Ga. 906 C Motors, rebuilt.  
6 Ton G.E. 250 v. 36/42" Ga. with gath. reel or Crab Rebuilt.  
8 Ton Goodman 9104C2 Permissible Gath. 500 v. 40/44" Ga.

#### COAL CRUSHERS

18x24 and 18x30 New Scottdale dbl. roll.

#### AIR COMPRESSORS

1200 cu. ft. 100# Worthington 2 stage Belted.  
490 cu. ft. 100# Worth.-100 HP Syn. Motor.  
173 cu. ft. 100# Pres. Chic. Pneu. Belted.  
90 cu. ft. 100# Pres. Chic. Pneu. Belted.  
9"x8" Sullivan Portable—motor driven.

**MOORHEAD-REITMEYER CO., INC.**

Serving the Coal Industry for more than a Quarter of Century

#### Rotary Con. & MG Sets (3 ph. 60 cy.)

640 KW AL Ch. 250 v.—860 HP Syn.  
500 KW West. Rotary Converter 3½ v. 6 phase 1200 RPM with transformers and switchboard.  
300 KW G.E. HC 12 Rotary 275 v. 6 ph.  
200 KW West. 250 v. 720 RPM—300 HP 2200 v.  
150 KW Ridgway 275 v. 900 RPM dir. con. 225 HP.  
50 KW G.E. 125 v.—75 HP West. 220/440.

#### AC Generators

1250 KVA West. 2 ped. Brdg. 440/3/60 1200 RPM with DC Exciter (New).

#### STEAM TURBINES & GEN. SETS

500 KW G.E. 250 v. DC—Terry mixed pressure.  
125 KVA AL Ch. Turbo Gen. 220/440/3/60.  
50 KW West. 125 v. DC—Westinghouse Turbine.

#### SLIP RING & SQ. CG. MOTORS

HP	Make	Speed	WDG	Type
500	G.E.	450	S.R.	MT 412
450	G.E.	257	S.R.	MT
350	G.E.	900	S.R.	I-M
300	West.	1750	S.R.	CW
200 (2)	G.E.	240	S.R.	MT 412
200	West.	600	S.C.	CS
150	West.	600		Syn.
100	West.	1750	S.R.	C-I
100	G.E.	500	S.R.	M 1-25-cy.
50	G.E.	900	S.R.	I-M
40 (3)	G.E.	600	S.R.	MT
40	G.E.	900	S.R.	MTC
35	West.	870	S.C.	CS

**Mayflower 7900**

#### DC MOTORS

HP	Make	Speed	WDG	Type
175	G.E.	475	ser.	MD 109
130	G.E.	550	ser.	CO 1812
100	G.E.	480	ser.	MD 108
100	West.	400	800	SK 190
75	West.	470	ep.	SK 180
75KW	West.	1000	ep.	S
70KW	G.E.	1250	ep.	DLC 204
70	G.E.	950	ep.	
50KW	G.E.	1350	ep.	RC
50	G.E.	1050	sh.	RC 14
40 (2)	West.	775	ep.	SK
40KW	West.	1050	ep.	SK
40	Roth	1500		
25	West.	825	ep.	SK 113
20	West.	750		
15	West.	850	ep.t	SK 93
15	Wh.	800	sh.	CM
13	West. (Enc.)	825	ep.	SK 113

#### GENERATORS, 230/250 v.

Speed	WDG	Type
400	HP G.E. slip ring	440/3/60 with rev. mag. control.
100	HP Vulcan Friction Slope Hoist	drum 36" dia. 36" wide 8½" flanges driven by G.E. 440/3/60 slip ring with rev. mag. control.
2	Fairmont Car Retarders.	
10	Torry Car 500/250 v. DC.	
54x54	2 Roll Coal Crusher.	
75	HP Vulcan 2 drum shaft, S.R. Motor.	
40	HP Lidgerwood sgl. fr. drum geared to 40 HP G.E. slip ring 220/440 v. 3 ph. 60 cy. MTC. Rev.	
30	HP Carlin double dr. fr. 13"x18"-5½" flgs.	
10	HP Lidgerwood Hoist—AC or DC Motor.	
5	Ton Shep.-AC Traveling Crane 35'9¾" span.	

**Pittsburgh 19, Penna.**

#### ROTARY CONVERTERS

500 KW G.E. SYN., 275 V., 6 Ph., 60 Cy., 1200 RPM, Pedestal Type, 2300/4000 V. Transformers.

#### MOTOR GENERATORS

150 KW G.E. SYN., 275 V., 2300 V., 3 Ph., 60 Cy., 900 RPM, Manual Switchgear.

150 KW G.E. SYN., 600 V., 2300/4000 V., 3 Ph., 60 Cy., 1200 RPM, Manual Switchgear.

#### LOCOMOTIVES

13-T Gen. Elec., 500 V., 827 Mts., 36"-42" Ga.  
13-T Gen. Elec., 250 V., 827 Mts., 36"-42" Ga.  
10-T JEFFREY, 250 V., 110 Mts., 36"-48" Ga.  
10-T JEFFREY, 250 V., MH-110 Mts., 44"-48" Ga.  
10-T WESTGHSE., 500 V., 907-C Mts., 36"-44" Ga.  
10-T WESTGHSE., 250 V., 907-C Mts., 36"-44" Ga.  
8-T WESTGHSE., 250 V., 906 Mts., 36" Ga.  
8-T GEN. ELEC., 250 V., 639 Mts., 36"-48" Ga.  
6-T WESTGHSE., 250 V., 903-C Mts., 22"-30" Ga.

Each unit listed above is owned by us and is available now for immediate purchase.

**WALLACE E. KIRK COMPANY**

INCORPORATED

501 Grant Building Pittsburgh, Pa.

## FLORENCE MACHINERY & SUPPLY CO. REBUILT COAL MINING EQUIPMENT

#### PIT CARS

105—1 Ton R.B. Card, 36" Ga.  
110—1 Ton P.B. Card, 36" Ga.

#### LOADERS

1—Manierre Type Box Car Egg Loader  
1—7-BU Joy Loader, 250 Volts DC

#### CONVEYORS

1—36" Picking Conveyor, 20' Centers  
1—28" Apron Egg Conveyor, 21' Centers, Gear Drive  
1—18" Drag Chain Conveyor, 8' Centers, Motorized  
1—16" Jack-Knife Drag Chain Conveyor, 18' Centers, Motorized  
1—16" Belt Conveyor, 25' Centers, Motorized  
1—16" Belt Conveyor, 45' Centers, All Steel, Motorized, New condition  
1—16" Belt Conveyor, 110' Centers, Motorized

#### SHAKER SCREENS

1—Double Deck, Lower deck 8' x 28', upper deck 36" x 40'

#### STEEL BINS

2—10' x 20' 3/16" Steel

1—16' x 24' Sectional

#### GENERATORS

1—100 KVA West. Syn. Motor, 2300 Volts AC  
1—96 KW, 2300 Volts AC, direct connected to a 14x17 Chase Engine  
1—25 KW Crocker-Wheeler, 250 Volts DC  
1—15 KW Ft. Wayne, 480 Volts AC

#### MISCELLANEOUS

1—All Steel Bucket Elevator, 28' Centers, 8 x 6 x 5 Mts. Buckets, all steel, Motorized  
1—5 Ton Fairbanks Tipple Scale with Weighing Hopper  
1—4' x 16' Revolving Screen, 5/8" Punched Plate  
1—Iron Fireman Stoker, with 1 H.P. Motor  
4—1 H.P. New Louis Allis B.B. Motors  
4—Mine Cages  
1—200 H.P. Double Drum Hoist, Motorized 20# Plate Frogs  
3—Sullivan CE-7 AC Coal Cutters  
3—37½ KVA Pittsburgh Transformers, 440-110/220 Volts  
100—Basket Type Dryers, 250 Volt DC Motors

We have a complete stock of practically everything

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**904 EQUITABLE BLDG.**

**DENVER 2, COLORADO**

Yards: Denver and Florence, Colorado

#### Storage Battery Locomotive

5 Jeffery 6 ton Battery Locomotives 36" to 44" ga.

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NEW and REBUILT  
STORAGE BATTERY

## LOCOMOTIVES

1½ to 10 Ton 13" to 56" Track Gauge

GREENSBURG MACHINE CO.

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#### FOR SALE

12 Mead-Morrison side dump cable road coal cars, 3 ton capacity, 26" guage.

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## COAL MINE EQUIPMENT SALES COMPANY

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TERRE HAUTE, INDIANA

### CUTTING MACHINES

- 1—29-B Jeffrey Arcwall, 250 volt, any gage, any adjustment
- 1—7-AU Sullivan hydraulic cutting and shearing machine 250 or 500 volt
- 1—CE-7 Sullivan shortwall, 250 volt
- 1—28-A Jeffrey shortwall, 250 volt

### LOCOMOTIVES

- 1—6-Ton Jeffrey MH-88, 250 volt, 44" gage with R-SE cable reel

### SUBSTATIONS

- 1—200-KW. G.E. Rotary converter outfit complete, 275 volt D.C. 6600/12000 volt A.C. with manual switchgear.

### A.C. and D.C. Stationary Motors, Starters, Transformers and Miscellaneous mine supplies.

We solicit your inquiries

### ALL-STATE EQUIPMENT CO.

LOGAN, W. VA.

### MISCELLANEOUS

- 1—35-HP. Cargo winch complete with 230 volt D.C. motor (new)
- 1—100-HP. Reeves Natural Gas Engine with 62.5 KVA G.E. alternator, 220 volt, 275 RPM. with complete switchboard equipment.

- 1—2-Stage Worthington air compressor, 175 C.F.M. 150 lbs. pressure

- 1—5' x 8' Fairmont vibrating screen

- 1—Sullivan bit sharpening machine with motor drive and automatic oil heating furnace.

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### COAL STRIPPING OUTFIT

- 1—Northwest 80-D, 2½ yd. Diesel Shovel, 1944 model.
- 1—Manitowoc 3500, 2 yd., high lift, Diesel Shovel, 43' boom, 38' sticks, 1945 model.
- 1—Bucyrus Erie 54-B, 2½ yd. Diesel Shovel, 1944 model.
- 1—Lima 1201 Diesel Dragline, 80' boom, 3 yd. and 3½ yd. buckets, with long cuts, wide treads, 1942 model.
- 5—Euclid 27 yd. bottom dump, model FDT, Coal Haulers, 1946 model.
- 2—Caterpillar D-8 Bulldozers, 1945 model. With horizontal drills, compressors, and usual assortment of small tools & supplies.

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### AIR COMPRESSORS:

- 12—Belted 360, 676, 870, 1000, 1300 ft.
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- 6—Electric 1300, 1500, 2200, 5000 ft.

### CARS & LOCOMOTIVES:

- 100—50 ton cap. Gondolas
- 35—50 ton cap. Flat Cars
- 4—35 & 65 ton Diesel Locomotives
- 6—10, 16, 20 & 30 ton Gas Locomotives
- 150—8000 & 10000 gal. cap. Tank Cars
- 20—12 yd. Std. ga. Steel Dump Cars

### RUBBER CONVEYOR BELTS:

- 1000', 60', 600', 30', 300', 20', 1000', 42", 900', 48", 1450', 36', 1200', 24", 900', 18", 600', 16", 350', 14".

### ELECTRIC LOCOMOTIVES:

- 15—3, 5, 8 ton Battery & Trolley.

### DIESEL GENERATORS:

- 12—100, 150, 180 & 480 KW.

### MINE LOADERS:

- 17—GD9, Elmo 21, Conway 20, 50, 60 & 75 and Sullivan HL3.

### STEEL TANKS:

- 30—8000, 10000 & 20000 gallon capacity.

### SHOVELS—DRAGLINES:

- 7—I yd., 1½ and 2 yd. Gas & Diesels.
- 16 yd. Elec. 160 ft. Boom Dragline.

R. C. STANHOPE, INC.  
60 E. 42nd Street New York 17, N. Y.

### MINE HOISTS

- 1—Thomas 24" dia. Drum with 50 H.P. Motor & Control

- 1—Ottumwa 36" dia. Drum with 75 H.P. Motor and Control

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- 1—Vulcan, Shaft Hoist, 72" dia. Suitable 300 ft. shaft. Motor with control to suit requirements.

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- 1—Vulcan, Cylindro-Conical, Shaft Hoist, Drum 7'8" Dia. Suitable 350 ft. shaft, 400 H.P. Motor with Control.

Other Hoists Available to suit all mining conditions.

Jones Mining Equipment Co.  
Empire Building, Pittsburgh 22, Pa.

### FOR SALE COAL CRUSHER AMERICAN PULVERIZER

Type A. C. Serial No. 2258  
Complete with V-Belt Sheave  
Excellent condition - Immediate delivery  
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- 1—4 Cu. Yd. Type "AX", Std. Red Arch Bucyrus-Erie Dragline Bucket complete with chains & sockets. Only used 45 days.

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24"x10' L&S Lathe

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16" to 24" Shapers

Also various other tools.

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AC & DC Motors; Rotary Converters & Control; Mine Type Compressor; Switchboard Parts, including large Knife Switches, Inverse Time Overload Relays, Meters, Circuit Breakers, Auxiliary Switches; also Demand Meters; 5-amp. House Meters; Lightning Arrestors; Fuse Cutouts; etc. Transformers Rewound.

Send us a list of your surplus electrical equipment and your present requirements.

Specialists in the furnishing of electrical requirements of the Coal Industry for more than 25 years.

R. H. BENNEY EQUIPMENT CO.  
5024 Montgomery Road Norwood 12, Ohio  
Better Known—Known to be Better

# SEARCHLIGHT SECTION

## LOCOMOTIVES

**Goodman:** All 250 volts.  
 1—6 ton, 30B, 43" 1—5 ton.  
 1—5 ton, W-1-2, 36".  
 2—5 ton, 2600 K.  
 2—6 ton, 33-1-4-T.  
 2—8 ton, 32-1-4-T.  
**Westinghouse:** All 250 volts.  
 1—4 ton 902, 48" with crabs.  
 4—904 c. 44" 500 volts and 250 volt. Also  
 906 motors and 102-904-115.  
 Bar steel frames from 6 ton, 4 ton.  
**G.E.:** All 250 volt 4 ton 1022, 44" as is  
 6 ton 803, 44" as is 5 ton 825, 44" & 36"  
 6 ton 822, 44" 8 ton 839 motors  
 6 ton 801  
 8 ton 839  
 Battery Locomotive, Ironton, Whitecomb  
 and 1½ ton Mercury.  
**Jeffrey:** 6 ton and 4 ton, all gauges. 250 volt.  
 8 ton, 250 and 500 volts, 10 ton, MH78,  
 500 volts.

**AERIAL TRAMWAYS • HOISTS • PUMPS • MOTORS • TRANSFORMERS • BOND WELDERS • RESISTANCE • COMPRESSORS • DUMPS • SPEED REDUCERS • FIELD FRAMES • GOODMAN HYDRAULIC • SHOVELS • MOTOR STARTERS AND CONTROLLERS-AC & DC • DROP BAR SUPPORTS (Gooseneck), 29B and 29C • MINING MACHINE TRUCKS • SWITCHBOARDS • CIRCUIT BREAKERS-AC & DC • COAL CRUSHERS (double roll 12"x16", (single roll) 24"x36", 24"x24") • LATHE, SWITCHES • AUTOMATIC CIRCUIT BREAKERS 250 volt 600 amps to 2000 amps • MANUAL CIRCUIT BREAKERS 600 amps to 3000 amps • HOISTS, overhead, AC 3-60-440 1 ton and 2 ton • 1 clam shell bucket 1½ cubic yard • MINE CARS • 2 SULLIVAN BIT SHARPENERS • R. R. SWITCHES 85# to 100# GENERATORS DC 250-275 volt, 30 KW to 100 KW. Also SPARE MOTORS DC and AC for mining machines and locomotives. BELT CONVEYORS, SLATE, LARRY, 2-5BU on Cats. 1-8BU on Cats. 2-Myers-Whaley, #3 and #4 Automatic and other loaders. DIESEL POWER PLANTS, 50 KW to 250 KW, 3-75 KVA 44000 to 2300 Volt G. E. transformers.**

## GUYAN MACHINERY COMPANY, Logan, W. Va.

### SUB STATIONS

1—150 KW Ridgway, Syn. M-G Set, 275 V. D.C. 3/60/2300 V.  
 1—200 KW Ridgway, same as above  
 1—200 KW G. E., same as above  
 1—500 KW Rotary Converter, 6/60/1200 RPM, 275 V. D.C. with 2300-4000 volt transformers.

### LOCOMOTIVES

1—13 Ton Jeffrey with MH-110 250 V motors.  
 1—6 Ton G. E. with 250 volt motors.  
 2—6 Ton Jeffrey with MH-88 250 V motors.  
 1—5 Ton Goodman with Type 41 250 V motors.

### COAL CUTTING MACHINES

1—35B Jeffrey Shortwall.  
 1—12AA Goodman Shortwall.  
 2—29C Jeffrey Arcwalls.  
 1—124EJ Goodman Slabbing.

Tippins Machinery Company  
 1001 Washington Boulevard  
 Pittsburgh 6, Pa.

**WESTINGHOUSE**  
**TYPE SK-MOTORS**  
*America's Best Stock*  
**WIRE INQUIRIES COLLECT**  
**MOTORS, GENERATORS,**  
**TRANSFORMERS**  
 1—1500 H.P.  
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**ELECTRIC EQUIPMENT CO.**  
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1 Low Pedestal  
**8 BU JOY LOADER**  
 220-440 Volts A/C current.  
**STANDARD CLAY MFG. CO.**  
 NEW BRIGHTON, PENNA.

## MINING MACHINES

**Jeffrey:** 28A, 250 V, 4—29B, 29C, 29CE with shearing head. Also 1 on cats. Revolving head for 29C.  
**Goodman:** 12A, 12AB, 12AA, 12G3A, 24B.  
 1—12G3, 220 volt and 2—142 DA, 500 volt.  
 2—Permissible Type 12CA, 6—112AA.  
 Motors for 212AA, both 250 and 500 v.  
 1—Hitch Cutter for Cross Head timbers.  
**Sullivan:** CE7, CE9, CE10, CR10 Low Vein.

### SUBSTATIONS — 275 volts, D. C.

1—300 KW Westing. Rotary.  
 1—150 KW West. Rotary.  
 1—200 KW 1—100 KW Ridgway M-G Sets.  
 1—200 KW Westinghouse M-G Set 900 RPM.  
 2300-270 volt.  
 1—100 KW Westinghouse M-G Set.

## SPARE ARMATURES

**Jeffrey** MH 110, MH 78, MH 73, and MH 64-350 Volts and 500 V. 29B, 35B and 28A. **Goodman** 34B, 30B, 30C, 12A, 2600 K and R; 12AB, 12AA, 33-1-4-T, 31-1-4-T, 32-1-4-T. **General Electric** 801, 803, 807, 819, 821, 825, 839. **Westinghouse** 904, 905, 906, 102, 907, YR2, 115. Also 200 KW Westinghouse **Rotary Converter Armature**, 250 V Bracket Type, 150 KW G.E., HCC Bracket Type. **Sullivan** CE6, CE7, CE9 and CE10.

## FOR SALE

600,000 CM insulated and bare copper 0000 trolley wire.

Steel Tipple and Steel Washery.

1000 KW 2300 V. 60 cy. 3600 RPM Westinghouse turbo-generator, jet condenser complete.

500 KW 2300 V. 60 cy. 3600 RPM Westinghouse turbo-generator, jet condenser complete.

12 x 12 Dean Holyoke vertical triplex pump, brass fitted, steel herringbone gears, 100 HP 230 V. DC motor and starter.

6 x 12 American horizontal geared pumps with Duraloy metal water ends.

Cement gun complete with trucks, tank, 13 x 8 compressor, motor, etc.

Many sizes of 230 V. DC motors.

2—1½" 6 x 19 x 425 ft. crucible steel hoisting cables, never used.

**ROBERT GAGE COAL COMPANY**  
 BAY CITY, MICHIGAN

## FOR SALE

We have for sale one coal mine which is mechanically equipped—7 BU Joy Loading Machine and one 11 BU Joy Loading Machine, only been used one year; Cutting Machine; In Fact, everything to operate a coal mine, all in good condition.

This is a slope mine, with railroad connections and have from 7' to 8½' vein of good clean coal. We own 103 acres of coal ourselves and plenty of acreage available to lease. Our present workings are within one-half mile of the bottom and 60 acres of coal lies next to our bottom.

We are only operating one loading machine now, with tonnage average of 300 tons, six days per week. All coal being sold for railroad locomotive fuel.

Anyone interested in a good long life small mine cannot afford to pass this opportunity up.

**WILKINS & BIGGS**  
**COAL COMPANY**  
 106 E. Boulevard Marion, Ill.

## VIBRATING SCREENS CRUSHERS—SCALES

### Immediate Shipment

3'x6"—1 deck Vibrat. Screen.....	\$495.00
3'x8"—2 deck Vibrat. Screen.....	595.00
3'x8"—1 deck Vibrat. Screen.....	585.00
3'x8"—2 deck Vibrat. Screen.....	685.00
3'x8"—3 deck Vibrat. Screen.....	885.00
Stoker Coal Crusher.....	345.00
Large Coal Crusher.....	795.00
15 Ton Truck Scale.....	450.00
20 Ton Truck Scale.....	510.00
5 Ton Tipple Scale.....	260.00

### BONDED SCALE COMPANY

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Visit our factory. We manufacture more than 150 models of Scales, Screens, Crushers, and Conveyors. Inspect several models in operation.

# SEARCHLIGHT SECTION

## FOR SALE

### MINING MACHINES

- 1—Sullivan CR3 Shortwall Cutting Machine. Late style rope type machine complete with electric cable and reel. 250 volts DC.
- 2—Sullivan CLES5 Longwall Mining Machines AC, 220 volts, 4 ft. cutter bars.
- 3—Goodman Longwall Mining Machines, 250 volts DC, 36" or 42" gauge.
- 1—Sullivan CE7 Shortwall Mining Machine, AC 220 volts, 3 phase, 60 cycle, tip turn truck, 7 ft. cutter bar, 36" or 42" gauge.
- 1—Sullivan CH11 Shearing Machine, DC 250 volts, 7 ft. cutter bars, 36" or 42" gauge.
- 3—Goodman 112AA Universal mining machines, #7146, and #7147, 6 ft. cutter bars, 36" gauge. Complete with gathering reels and trucks.

### LOCOMOTIVES

- 1—4 ton Goodman Locomotive, type 75A04T, 28" gauge.
- 1—4 ton Goodman Locomotive, type 76A04T, 36" gauge.
- 2—5 ton Goodman Locomotives, type W1-2AS, 42" gauge.
- 1—6 ton Goodman Locomotive, type 13314T, 42" gauge, ball bearing motors.

### HOISTS

- 1—Ottumwa silent chain drive hoist, drum inside face 30", inside flange 7", drum diameter 36", 90 teeth on big gear, 25 teeth on pinion gear, overall length 7' 9", overall width 9", overall height 5' 6", complete with 40 HP GE slip ring motor, 3 phase, 60 cycle, 220 volts, 900 rpm with reversible controller and re-

sistance. Rope speed 290 ft. per minute. 130 teeth on chain drive gear, 16 teeth on motor pinion.

1—Ottumwa Electric single rigid cylindrical drum hoist complete with full automatic control. Weight of cages 7000 lbs. weight of car 2500 lbs. weight of coal 6000 lbs. lift 310 ft., diameter of rope 1 1/4", diameter of drum is 60" to 84", brake is 85" diameter, 8" face, post type oil operated. Drum shaft bearings are 10" x 20". Hoist complete with single reduction gears, 19 and 229 teeth, 2 1/2 DP, 11" face. Equipped with 200 HP motor 3/60/220 volts, 600 rpm. Drum has five grooves on the 60" face, eleven grooves up the cone, and four grooves on the 84" diameter. Drum has rope capacity of 326 ft. plus three dead turns.

1—Ottumwa Iron Works single drum hoist size 2678, width of drum 28" height of flange 5", diameter of drum 39", teeth in pinion gear 16, teeth in drum gear 86, direct connected by flexible coupling to Ottumwa Iron Works Speed Reducer size SF-11, #R220 which in turn is connected by flexible coupling to 60 HP GE motor, slip ring, 220/440 volts, 3 phase, 60 cycle, 900 rpm, complete with reversible controller and resistance.

### PUMPS

1—Gould Centrifugal pump, 3" suction, 2" discharge, capacity 225 rpm, at 105 ft. head complete with 10 HP Westinghouse motor, 3/60/220/440 volts, 1750 rpm, and magnetic starter.

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- 1—Gould pump 6 x 10, 3" suction, 3" discharge.
- 1—Gould pump 6 x 12, figure 1531, 4" suction, 4" discharge.

### VIBRATORS

- 1—Robins Vibrex screens made by Robins Conveying Belt Company. Inspection numbers VSL 700, VSL 701. Speed of shaft 1000 rpm.
- 3—Tyler "600" Vibrating screens, two surface vibrators. One is 5' x 12'. Two are 5' x 10'.
- 1—Tyler-Niagara Vibrating screen, single deck, type 100, 57" long by 54" wide. Overall dimensions, length 60", width 49", height 30".

### CRUSHERS

- 1—Stephens Adamson 30 x 30 double roll crusher. Will crush from 20" down to 1 1/4".
- 1—American Pulverizer Crusher, type AC, Machine number AC3B. Crushes from 20" down to 1/2".
- 1—Link-Belt 36 x 60 double roll crusher equipped with gear drive.

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- 1—1000 gpm. 45 ft. hd. Allis Chalmers Pump.
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15	Westg.	560	S-7
15	Al. Ch.	800	
15	Westg.	1700	SK
13½	Al. Ch.	700	
13	Cr. Wh.	1100	CM
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10	Cr. Wh.	825	CM

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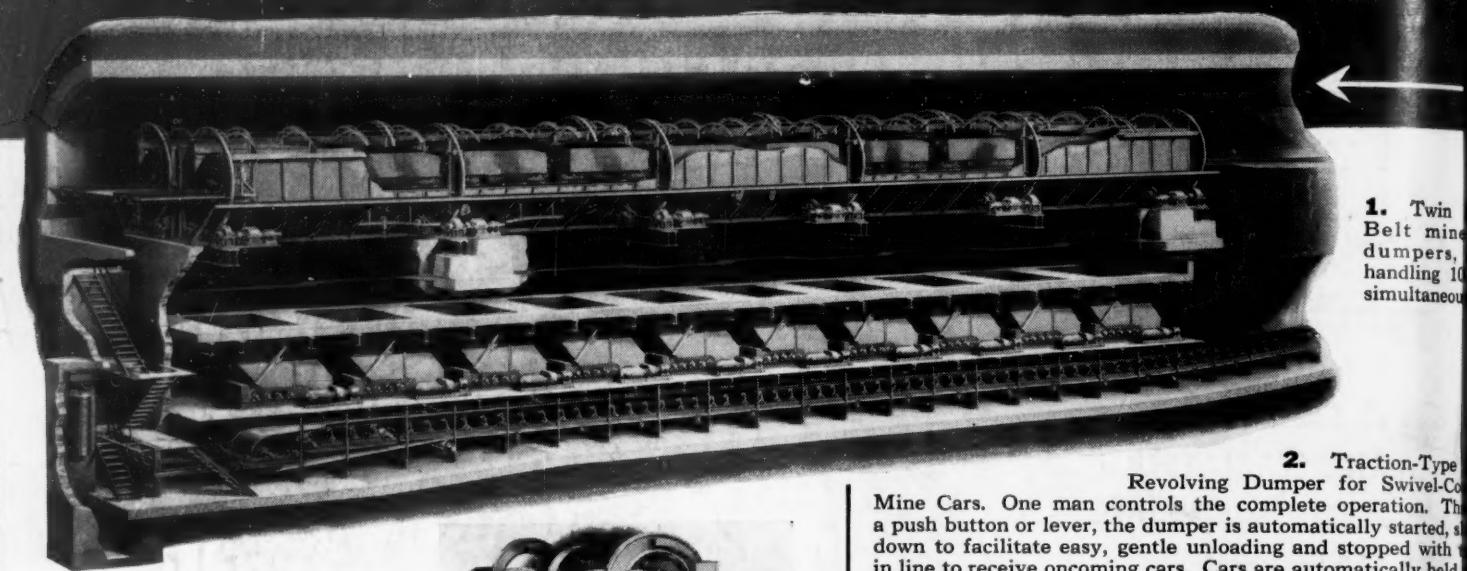


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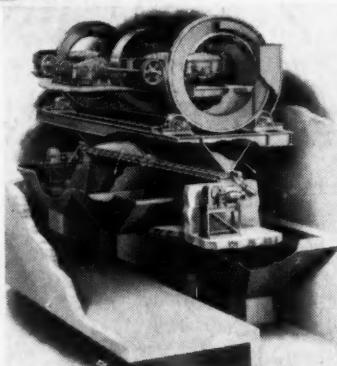
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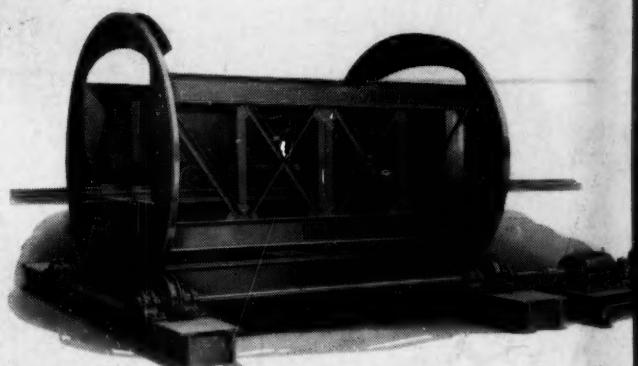


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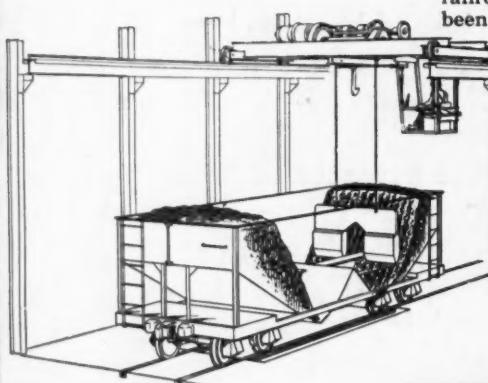
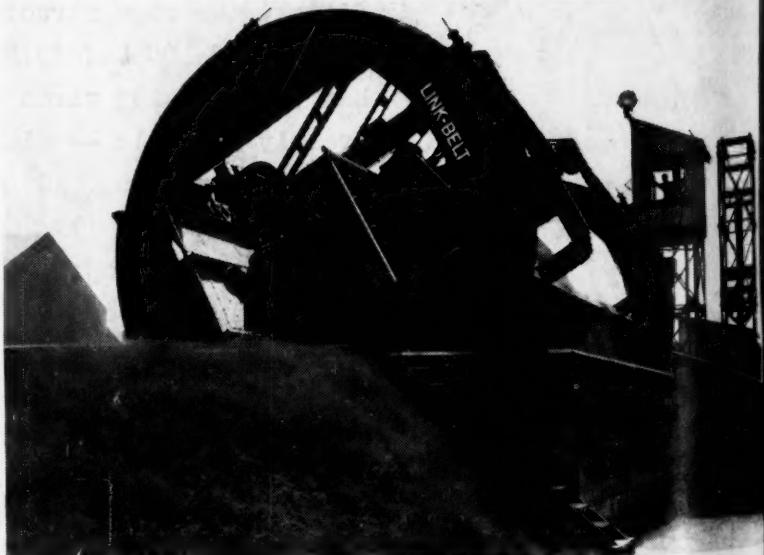
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3. Gear Driven Revolving Mine Car Dumper in combination with motor-operated fly gates, provides for properly discharging any combination of two cars loaded with rock or coal, to the coal and rock hoppers respectively. The dumper revolves through an angle of 135° in either direction, automatically reverses and stops in upright position.



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